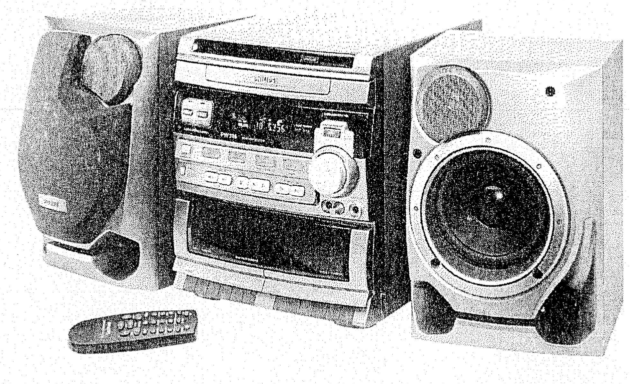
Mini System

FW325/22
FW326/21/21M/22/34

Service
Service
Service



Service Manual

COMPACT
disc
DIGITAL AUDIO

TABLE OF CONTENTS

Page
Location of pc boards & Version variations 1-2
Technical Specifications 1-3
Measurement setup 1-4
Service Aids, Safety Instruction, etc. 1-5
Instruction for use: European version exerpt 2-1
Additional featuress - others 2-9
Disassembly Instructions & Service positions 3-1
Service Test Programs 3-3
Set Block diagram 4
Set Wiring diagram 5
Front Board 6
Tuner Board: ECO5 Sys 7B
Tuner 95 .... 7D
MTF Module 9
ECO Short Loader Module 10
Combi Board 11
Set Mechanical Exploded view & parts list 12

CLASS 1
LASER PRODUCT

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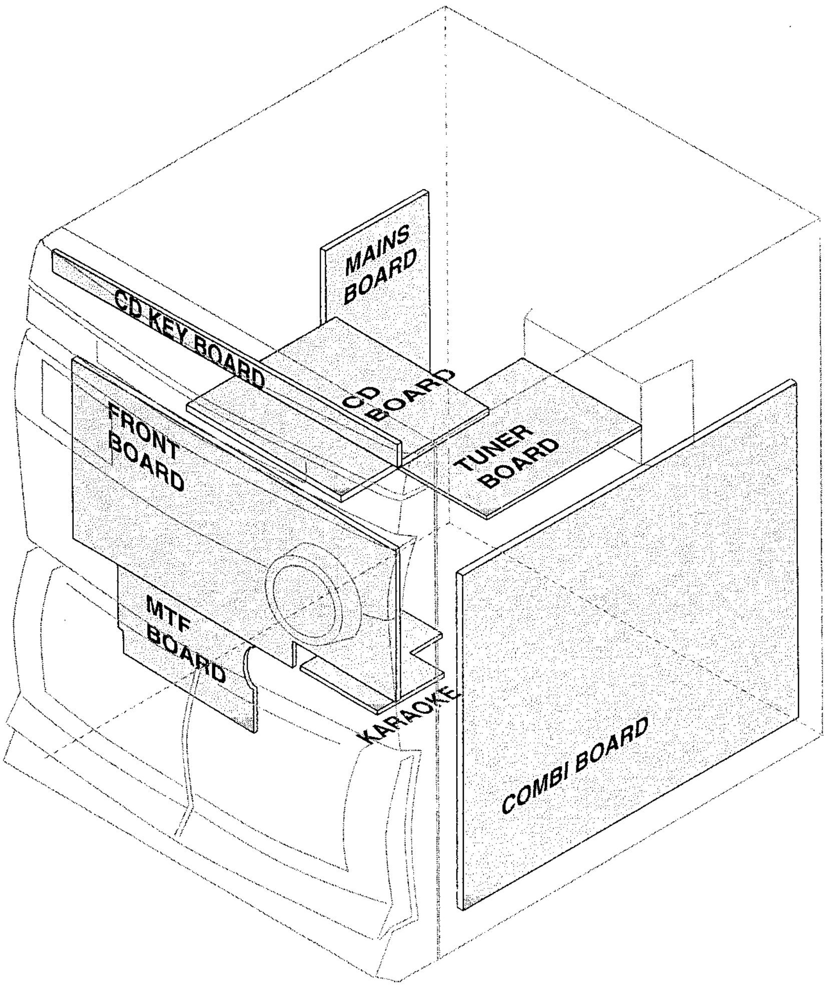
PCS 100 273

PHILIPS

LOCATION OF PC BOARDS


MAINS BOARD
CD KEY BOARD
CD BOARD
FRONT BOARD
TUNER BOARD
MTF BOARD
KARAOKE
COMBI BOARD

VERSION VARIATIONS:

Type /Versions: / Features & Board in used:	FW326						FW325	
	/21	/21M	/22	/34			/22	
Aux Input	x	x	x	x			x	
Line Output								
Subwoofer Output								
Surround Output								
Digital Output								
Dolby B								
RDS			x					
Incredible Surround	x	x	x	x				
Karaoke Feature	x	x						
Tuner board - ECO5 Sys	x	x		x				
Tuner board - Tuner 95			x				x	
Remote Control RC0797/01	x	x	x	x				
Remote Control RC0798/01							x	

SPECIFICATIONS

GENERAL:

Mains voltage : 100V for /26
110-127V/220-240V Switchable for /21
120V for /37
220V for /33
220-230V for /22/34
230V for /25
230-240V for /30
Mains frequency : 50/60Hz
Power consumption : < 15 W at power mode "OFF"
< 45 W at 1/8 rated power out
Clock accuracy : < 4 seconds per day
Dimension centre unit : 265 x 310 x 330mm

TUNER:

FM

Tuning range : 87.5-108MHz
65.81-74MHz for /34
Grid : 50kHz (& 30kHz for /34)
100kHz for /37
IF frequency : 10.7MHz ± 25kHz
Aerial input : 75ohm coaxial
300ohm click fit for /37
Sensitivity at 26dB S/N : < 7μV
Selectivity at 600kHz bandwidth : > 50dB
Image rejection : > 25dB [> 75dB]
Distortion at RF=1mV, dev. 75kHz : < 3% [< 2%]
-3dB Limiting point : < 7μV
Crosstalk at RF=1mV, dev. 40kHz : > 18dB [> 26dB]

MW

Tuning range : 531-1602kHz
530-1700kHz for /21/37
Grid : 9kHz
10kHz for /21/37
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : < 4.0mV/M
Selectivity at 18kHz bandwidth : > 18dB
IF rejection : > 45dB
Image rejection : > 28dB
Distortion at RF=50mV, m=80% : < 5% [< 7%]

LW

Tuning range : 153-279kHz
Grid : 3kHz
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : [< 7.0mV/M]
Selectivity at 18kHz bandwidth : [> 24dB]
IF rejection : [> 26dB]
Image rejection : [> 35dB]
Distortion at RF=50mV, m=80% : [< 7%]

AMPLIFIER:

Output power (6ohm, 1 kHz, 10% THD) : 2 x 25W ± 1dB
Frequency response within -3dB : 50Hz-15kHz
Dynamic Bass Boost : DBB ON, DBB Off 1)
Digital Sound Control : Jazz, Techno, Optimal, Rock 1)
Incredible Surround : IS ON, IS Off 1)
Headphone output at 32 ohm : 16.5mW
Input sensitivity
Aux/Line-in : 700mV ± 2dB at 600ohm
Mic : 2.5mV ± 2dB at 600ohm

CASSETTE RECORDER:

Number of track : 2 x 2 stereo
Tape speed : 4.76 cm/sec ± 2%
1.7 x 4.76 cm/sec
Wow and flutter : < 0.4% DIN
Fast-wind/rewind time C60 : 110 sec
Bias system : 75kHz ± 5kHz
Rec/Pb frequency response within 8dB : 80Hz - 12.5kHz
Signal to noise ratio : > 43dB

COMPACT DISC:

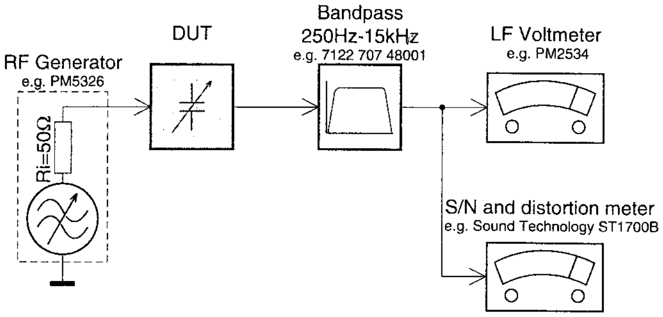
Measurement done at output conn. of the CDC module.
Frequency response within ± 1.5dB : 20Hz - 20kHz
Output level (in Vrms) : 550mV ± 1dB unloaded
Signal/Noise ratio (A-weighted) : > 80dBA
Distortion at 1kHz : < 0.5%
Channel difference at 1kHz : < 1dB
Channel crosstalk at 1kHz : > 45dB
De-emphasis : 0 or 15/50 mS (Switched by subcode on the disc)

[....] Values indicated are for "Tuner 95 Board" only

1) Frequency response in each setting is software controlled.

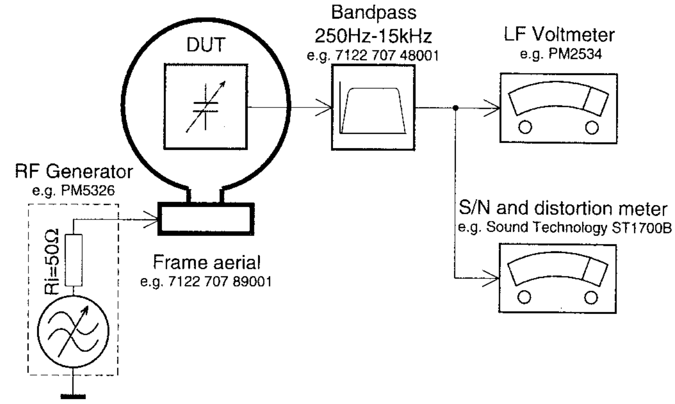
MEASUREMENT SETUP

Tuner FM


Bandpass
250Hz-15kHz
e.g. 7122 707 48001
DUT
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
S/N and distortion meter
e.g. Sound Technology ST1700B

Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

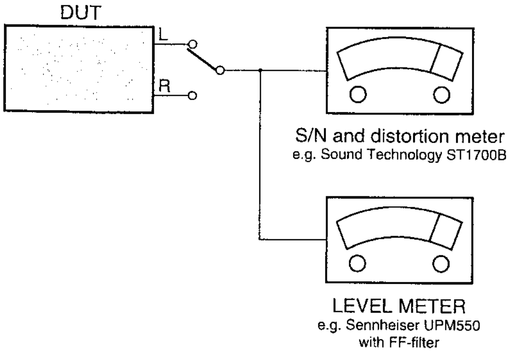
Tuner AM (MW,LW)


Bandpass
250Hz-15kHz
e.g. 7122 707 48001
DUT
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
S/N and distortion meter
e.g. Sound Technology ST1700B
Frame aerial
e.g. 7122 707 89001

To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday´s cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

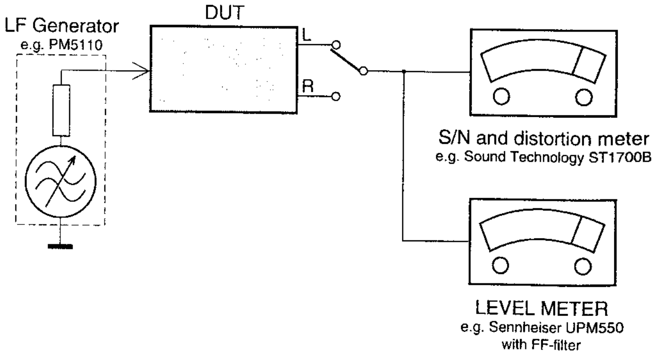
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)


DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071


LF Generator
e.g. PM5110
DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

SERVICE AIDS

Service Tools:

Universal Torx driver holder	4822 395 91019
Torx bit T10 150mm	4822 395 50456
Torx driver set T6 - T20	4822 395 50145
Torx driver T10 extended	4822 395 50423

Cassette:

SBC419 Test cassette CrO2	4822 397 30069
SBC420 Test cassette Fe	4822 397 30071
MTT150 Dolby level 200nWb/M	4822 397 30271

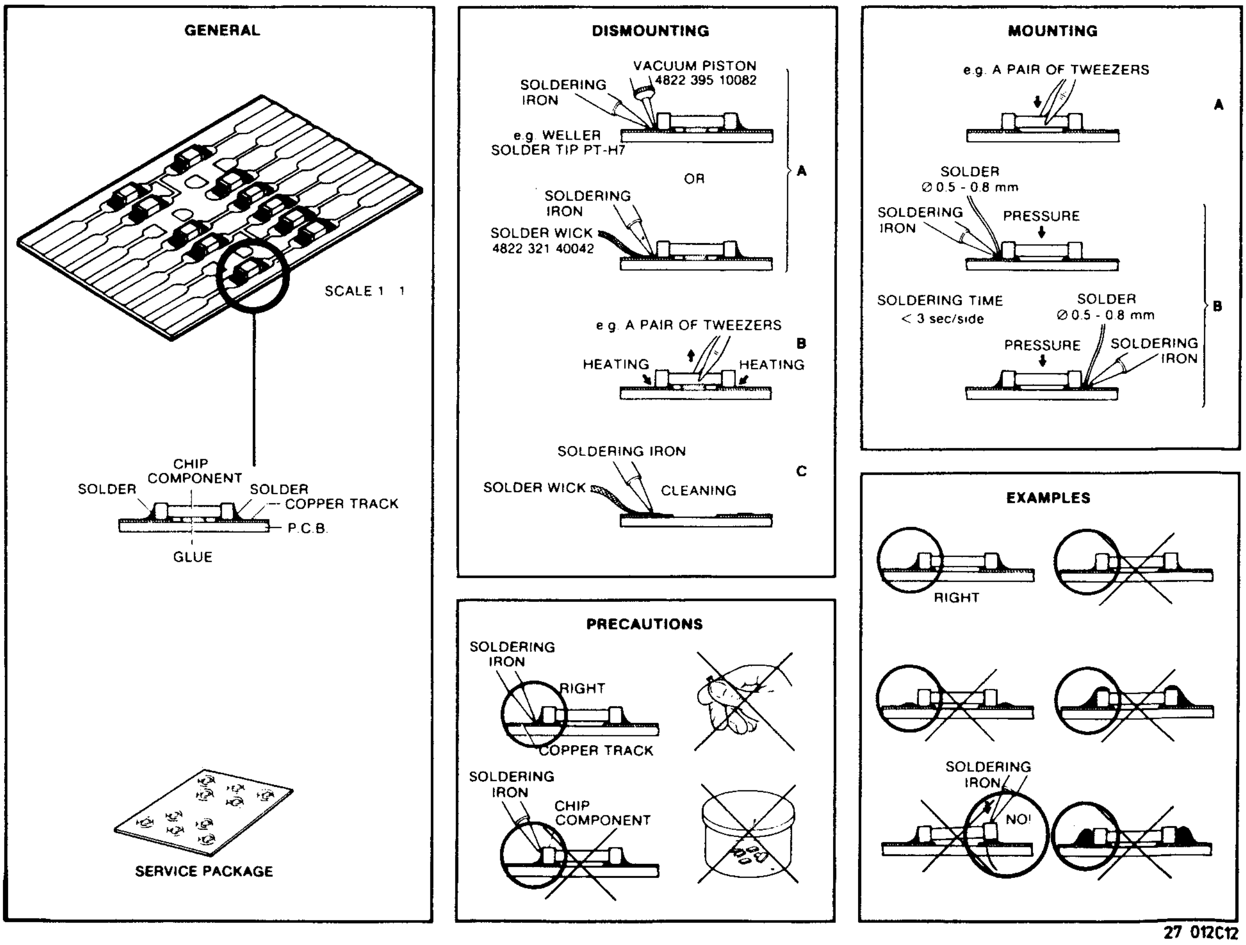
Compact Disc:

SBC426/426A Test disc 5 + 5A	4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz	4822 397 30155
SBC429 Audio Signals disc	4822 397 30184
Dolby Pro-logic Test Disc	4822 395 10216

ESD Equipment:

Anti-static table mat - large 1200x650x1.25mm	4822 466 10953
Anti-static table mat - small 600x650x1.25mm	4822 466 10958
Anti-static wristband	4822 395 10223
Connector box (1MΩ)	4822 320 11307
Extension cable (to connect wristband to conn. box)	4822 320 11305
Connecting cable (to connect table mat to conn. box)	4822 320 11306
Earth cable (to connect product to mat or box)	4822 320 11308
Complete kit ESD3 (combining all above products)	4822 320 10671
Wristband tester	4822 344 13999

HANDLING CHIP COMPONENTS


GENERAL
SCALE 1 : 1
CHIP COMPONENT
SOLDER
SOLDER
COPPER TRACK
P.C.B.
GLUE
SERVICE PACKAGE
DISMOUNTING
VACUUM PISTON 4822 395 10082
SOLDERING IRON
e.g. WELLER SOLDER TIP PT-H7
OR
SOLDERING IRON
SOLDER WICK 4822 321 40042
A
e.g. A PAIR OF TWEEZERS
HEATING
HEATING
B
SOLDERING IRON
SOLDER WICK
CLEANING
C
MOUNTING
e.g. A PAIR OF TWEEZERS
A
SOLDER Ø 0.5 - 0.8 mm
SOLDERING IRON
PRESSURE
SOLDERING TIME < 3 sec/side
SOLDER Ø 0.5 - 0.8 mm
PRESSURE
SOLDERING IRON
B
EXAMPLES
RIGHT
SOLDERING IRON
NO!
PRECAUTIONS
SOLDERING IRON
RIGHT
COPPER TRACK
SOLDERING IRON
CHIP COMPONENT
27 012C12

ESD

GB WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD).
Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

F ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

D WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

NL WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

I AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

GB

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

NL

Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

F

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utiliséés les piéces de rechange identiques à celles spécifiées.

D

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

I

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA."

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

CLASS 1
LASER PRODUCT
3122 110 03420

GB Warning !

Invisible laser radiation when open.
Avoid direct exposure to beam.

S Varning !

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

SF Varoitus !

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

DK Advarse !

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

INDEX

General Information *5*
Safety Information *5*
Preparation .... *6 - 7*
Controls .... *8 - 9*
Operating The System .... *10 - 11*
CD .... *12 - 13*
Tuner .... *14 - 16*
Tape .... *16 - 17*
Aux *17*
Recording .... *18 - 19*
Clock *19*
Timer *20*
Maintenance *21*
Specifications *21*
Troubleshooting *22*

GENERAL INFORMATION

General Information

- ***The type plate (which contains the serial number) is located at the rear of the system.***
- ***Recording is permissible if copyright or other rights of third parties are not infringed.***
- ***This product complies with the radio interference requirements of the European Community.***

Environmental Information

All unnecessary packaging material has been omitted. We have done our utmost to make the packaging easily separable into three mono-materials: cardboard (box), polystyrene foam (buffer) and polythene (bags, protective foam sheet).

Your system consists of materials which can be recycled and reused if disassembled by a specialized company. Please observe the local regulations regarding the disposal of packaging materials, exhausted batteries and old equipment.

Accessories *(Supplied)*

- Remote control
- Batteries (2 x AAA size) for remote control
- AM loop antenna
- FM antenna wire
- AC power cord

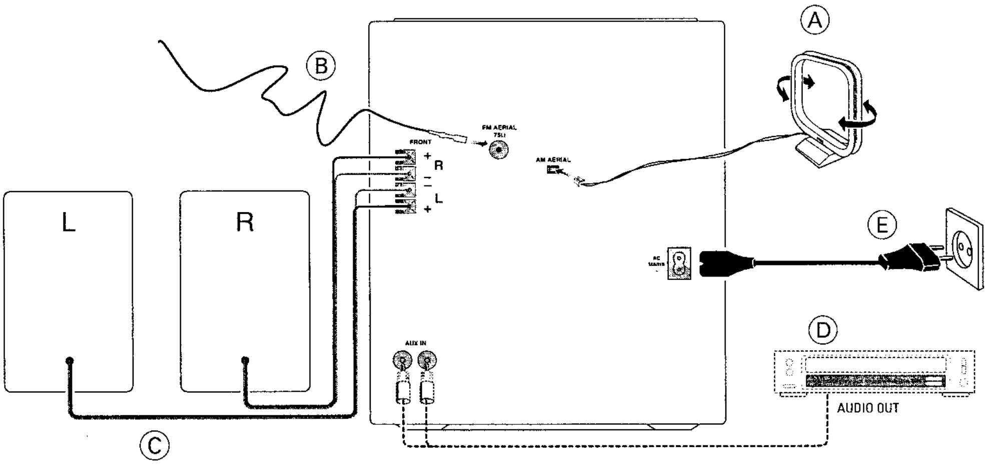
SAFETY INFORMATION

Safety Information

- Before operating the system, check that the operating voltage indicated on the typeplate (or the voltage indication beside the voltage selector) of your system is identical with the voltage of your local power supply. If not, please consult your dealer. The type plate is located at the rear of your system.
- When the system is switched on, do not move it around.
- Place the system on a solid base (e.g. a cabinet).
- Place the system in a location with adequate ventilation to prevent internal heat build-up in your system.
- Do not expose the system to excessive moisture, rain, sand or heat sources.
- Under no circumstances should you repair the system yourself, as this will invalidate the warranty!
- If the system is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lens of the CD unit inside the system. Should this occur, the CD player will not operate normally. Leave the power on for about one hour with no disc in the system until normal playback is possible.
- Electrostatic discharge may cause unexpected problems. See whether these problems disappear if you unplug the AC power cord and plug it in again after a few seconds.
- **To disconnect the system from the power supply completely, remove the AC power plug from the wall socket.**

PREPARATION

Rear Connections



PREPARATION

Ⓐ AM Antenna Connection

Connect the supplied loop antenna to the AM AERIAL terminal. Place the AM loop antenna far away from the system and adjust its position for the best reception.

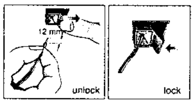
Ⓑ FM Wire Antenna Connection

Connect the supplied FM wire antenna to the FM 75 Ω terminal. Adjust the position of the FM antenna for the best reception.

Outdoor Antenna
For better FM stereo reception connect an outdoor FM antenna to the FM AERIAL 75 Ω terminal using a 75 Ω coaxial wire.

Ⓒ Speaker Connections

- Connect the right speaker to Front terminal R, with the red wire to + and the black wire to –.
- Connect the left speaker to Front terminal L, with the red wire to + and the black wire to –.
- Clip the stripped portion of the speaker wire as shown.


12 mm
unlock
lock

Ⓓ Connecting other equipment to your system

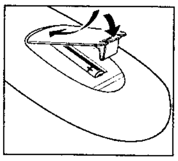
You can connect the audio left and right OUT terminals of a TV, VCR, Laser Disc or DVD player to the AUX IN terminals at the rear of the system.

Ⓔ AC Power Supply

After all other connections have been made, connect the AC power cord to the system and to the wall outlet.

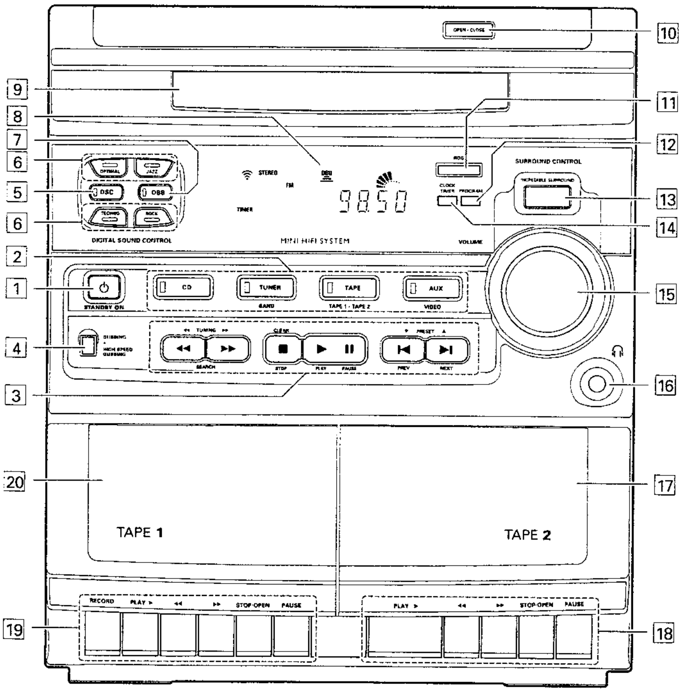
Inserting batteries into the Remote Control

- Insert the batteries (Type R03 or AAA) into the remote control as shown in the battery compartment.



- To avoid damage from possible battery leakage, remove dead batteries or batteries that will not be used for a long time. For replacement, use type R03 or AAA batteries.

CONTROLS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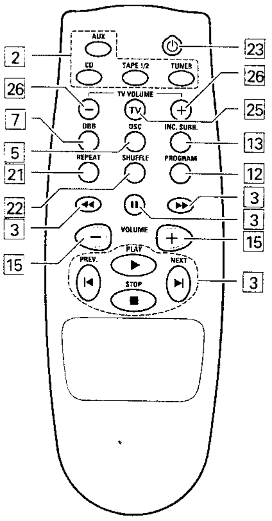
OPEN•CLOSE
STEREO
FM
TIMER
98.50
SURROUND CONTROL
CLOCK
TIMER
PROGRAM
DIGITAL SOUND CONTROL
DSC
DBB
MINI HI-FI SYSTEM
VOLUME
STANDBY ON
CD
TUNER
TAPE
AUX
BAND
TAPE 1 · TAPE 2
VIDEO
TUNING
PRESET
SEARCH
STOP
PLAY
PAUSE
PREV
NEXT
TAPE 1
TAPE 2
RECORD
PLAY ►
STOP·OPEN
PAUSE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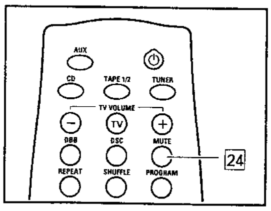
15
3
AUX
CD
TAPE 1/2
TUNER
TV VOLUME
TV
DBB
DSC
INC. SURR.
REPEAT
SHUFFLE
PROGRAM
VOLUME
PLAY
PREV.
NEXT
STOP

FW 326


AUX
CD
TAPE 1/2
TUNER
TV VOLUME
TV
DBB
DSC
MUTE
REPEAT
SHUFFLE
PROGRAM
24

FW 306
FW 325

CONTROLS

Controls on the system and remote control

1 **STANDBY-ON**
- to switch the system on or to standby mode.
- to store radio stations automatically by pressing and holding for 2 seconds.

2 **SOURCE** : to select the following.

CD
- to select CD mode.

TUNER / (BAND)
- to select Tuner mode. When in tuner mode; to select the waveband: FM, MW or LW.

TAPE / (TAPE 1•TAPE 2)
- to select Tape mode.

AUX / (VIDEO)
- to select sound from an external source (e.g. TV, Laser Disc, DVD or VCR player).

3 **MODE SELECTION**

SEARCH ◀◀ ▶▶ (TUNING ◀◀ ▶▶)

for CD .... to search backward/forward.
for TUNER ..... to tune to a lower or higher radio frequency.

STOP ■ (CLEAR)

for CD .... to stop CD playback or clear a program.
for TUNER ..... to stop programming.

PLAY PAUSE ▶ II

for CD .... to start or interrupt playback.

PREV I◀ / NEXT ▶I (PRESET ▲ ▼)

for CD .... to skip to the beginning of the current or previous/next track.
for TUNER ..... to select a preset station in memory.

4 **DUBBING**
- to dub a tape in normal or high speed.

5 **DIGITAL SOUND CONTROL (DSC)**
- to select the desired sound effect : OPTIMAL, JAZZ, ROCK or TECHNO.

6 **DIGITAL SOUND CONTROL DISPLAY PANEL**
- to view the selected DSC display.

7 **DYNAMIC BASS BOOST (DBB)**
- to switch on bass boost to enhance bass response or to switch off bass boost.

8 **DISPLAY**
- to view the current setting of the system.

9 **CD TRAY**

10 **OPEN•CLOSE**
- to open or close the CD tray.

11 **RDS** *(available in model FW326 only)*
- to select RDS data.

12 **PROGRAM**
- to program CD tracks in CD mode or preset radio stations in tuner mode.

13 **INCREDIBLE SURROUND** *(available in model FW326 only)*
- to switch on or off the surround sound effect.

14 **CLOCK•TIMER**
- to view clock, set clock or timer.

15 **VOLUME**
- to adjust the volume level.

16 🎧
- to connect headphones.

17 **TAPE DECK 2**

18 **TAPE DECK 2 OPERATION**

PLAY ▶ .... to start playback.
◀◀ .... to rewind the tape.
▶▶ .... to fast forward the tape.
STOP•OPEN .... to stop playback or to open the tape door.
PAUSE .... to interrupt playback.

19 **TAPE DECK 1 OPERATION**

RECORD .... to start recording.
PLAY ▶ .... to start playback.
◀◀ .... to rewind the tape.
▶▶ .... to fast forward the tape.
STOP•OPEN .... to stop playback/recording or to open the tape door.
PAUSE .... to interrupt playback or recording.

20 **TAPE DECK 1**

21 **REPEAT**
- to repeat a CD track.

22 **SHUFFLE**
- to play all the tracks in random order.

23 ⏻
- to switch the system to standby mode.

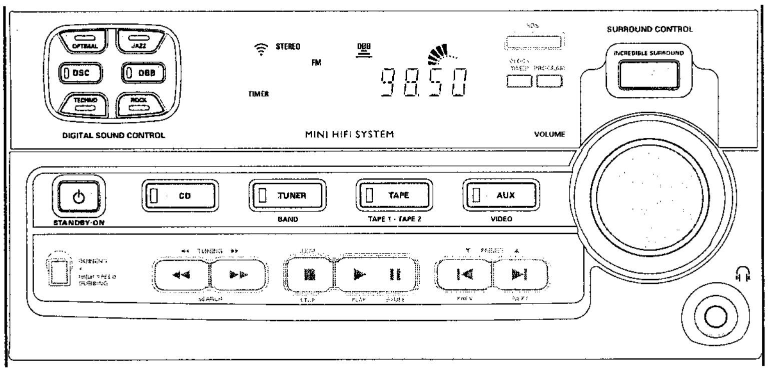
24 **MUTE** *(available in model FW306 and FW325 only)*
- to switch off the sound temporarily.

25 **TV** *(RC 5 code only)*
- to select TV mode.

26 **TV VOLUME** *(RC 5 code only)*
- to adjust the TV volume level.

Notes for remote control:
- *First select the source you wish to control by pressing one of the source select keys on the remote control (e.g. CD, TUNER, TAPE 1/2 or AUX).*
- *Then select the desired function (PLAY, NEXT, etc.).*

OPERATING THE SYSTEM



Important:
Before you begin operating the system, complete the preparation procedures.

Demonstration mode

The system has a demonstration mode that shows the various features offered by the system. ***Whenever the system is switched on from the wall socket, the demonstration mode will start automatically.***

Note:
- *During demonstration mode, if you press any source (or standby-on) button, the system will switch to the respective (or standby) mode.*
- *When the system is switched to standby mode, 5 seconds later, the demonstration mode will resume.*

To cancel demonstration mode
- Press and hold **STOP ■** *(on the system only)* for ***3 seconds*** to stop the demonstration.
  → The demonstration mode will be switched off permanently.
  → The system will switch to standby mode.

Easy Set

EASY SET allows you to store all available radio stations in a particular band (FM, MW or LW) automatically.

- Press and hold **STANDBY•ON** *(on the system only)* for 2 seconds; when the system is in standby or demonstration mode.
  → "EASY SET" will be displayed and followed by "TUNER".
  → EASY SET will start with the last active band.
  → All available radio stations with sufficient signal strength will be stored or until 40 presets are filled.

Notes :
- *When EASY SET is used, all previously stored stations will be erased.*
- *The last preset station will appear on the display when EASY SET is completed.*

Switching the system ON

- Press **STANDBY•ON** *(on the system only)*, **CD**, **TUNER**, **TAPE** or **AUX**.

Switching the system to standby mode

- Press **STANDBY•ON** again.
  → The system will switch to standby mode.

Selecting the Source

- Press the respective source selection button: **CD**, **TUNER**, **TAPE** or **AUX**.
  → The display indicates the selected source.

Note:
- *For an external source, make sure that you have connected the audio left and right OUT terminals of the external equipment (TV, VCR, Laser Disc or DVD player) to the AUX IN terminals.*

OPERATING THE SYSTEM

Sound Control

Volume Adjustment

Adjust **VOLUME** to increase or decrease the sound level.

For Personal Listening

Connect the headphones plug to the 🎧 socket at the front of the system. The speakers will be muted.

Digital Sound Control (DSC)

The DSC feature enables you to enjoy special sound effects that have preset equalizer settings, providing the best music reproduction.

- Press **DIGITAL SOUND CONTROL (DSC)** to select OPTIMAL, JAZZ, ROCK or TECHNO.
  → The Digital Sound Control display panel will light up respectively.
  → "OPTIMAL, JAZZ, ROCK or TECHNO" will be displayed.

Automatic DSC-DBB selection

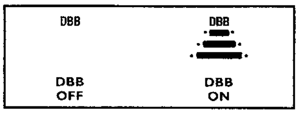
The best setting for the DBB is automatically generated for the respective DSC selection. You can manually select the DBB setting that best suits your listening environment.

DSC Selection	DBB On/Off
Optimal →	On
Techno →	On
Rock →	Off
Jazz →	Off

Dynamic Bass Boost (DBB)

The DBB mode enhances the bass response.

- Press **DBB** to switch on bass boost.
  → The DBB button lights up.
  → "DBB ON" will be displayed.



To switch off DBB

- Press **DBB** again.
  → The DBB button light is switched off.
  → "DBB OFF" will be displayed.

Note:
– *Some CDs or tapes might be recorded in high modulation. It may cause a distortion at high volume. If this occurs, switch off Incredible Surround (if available), DBB level or reduce the volume.*

Incredible Surround *(available in model FW326 only)*

Normal stereo sound is determined by the distance between the front speakers. When Incredible Surround is switched on, it magnifies the virtual distance between the front speakers for an incredibly wide, enveloping, stereo effect.

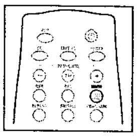
- Press **INCREDIBLE SURROUND** to switch on.
  → The INCREDIBLE SURROUND button lights up.
  → "IS" will be displayed.

To switch off Incredible Surround

- Press **INCREDIBLE SURROUND** again.
  → The INCREDIBLE SURROUND button light is switched off.
  → "IS OFF" will be displayed.

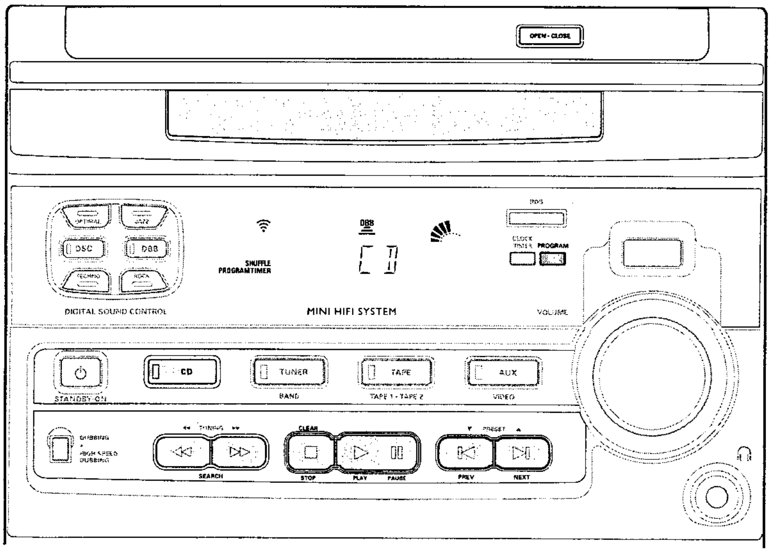
Mute *(available in models FW306 and FW325 remote control only)*

This feature allows you to temporarily switch off the sound of the system without switching off the system when you require a moment of silence.



- Press **MUTE** on the remote control to switch off the sound.
  → "MUTE" will be displayed.
- Press **MUTE** again on the remote control or increase the **VOLUME** level to switch on the sound.

CD



Warning!

1) This system is designed for conventional CDs. Do not use any accessories like disc stabilizer rings or CD treatment sheets, etc., which may damage the CD mechanism.

2) Do not load more than one disc into the tray.

3) When the CD tray is loaded with a CD, do not turn over or shake the system. This may jam the CD mechanism.

Loading the CD

1 Press **CD** to select CD mode.

2 Press **OPEN•CLOSE**.
  → The CD tray slides out.

3 Load a CD with the ***printed side up*** in the tray.

4 Press **OPEN•CLOSE** to close the CD tray.
  → The total number of tracks and playing time appear on the display.

Playing a CD

1 Press **PLAY** ▶ to start playback.
  → The track number and elapsed playing time of the current track appear on the display.
- To interrupt playback, press **PAUSE II**.
  → The playing time flashes.
- To resume playback, press **PLAY** ▶ again.

2 To stop playback, press **STOP** ■.

Note:
– *When the CD has stopped playing, the system will switch to the standby mode after 15 minutes if no button is pressed.*

Selecting a desired track

Selecting a desired track at the stop mode

1 Press **PREV** I◀ or **NEXT** ▶I until the desired track appears on the display.

2 Press **PLAY** ▶ to start playback.
  → The selected track number and elapsed playing time appear on the display.

Selecting a desired track during playback

1 Press **PREV** ⏮ or **NEXT** ⏭ until the desired track appears on the display.
   → The selected track number and elapsed playing time appear on the display.
- If you press **PREV** ⏮ once it will skip to the beginning of the current track and play the track again.

Searching for a particular passage during playback

- Press and hold ◀◀ or ▶▶ until the desired passage is located.
   → The volume will be reduced.
- Play returns to normal when ◀◀ or ▶▶ is released.

Programming Tracks

Programming tracks of a loaded CD is possible in the stop mode. The display will indicate the total tracks stored in the program. Up to 20 tracks can be stored in the memory in any order. When 20 tracks are stored and you attempt to store another track, the display will show "PROGRAM FULL".

1 Load the desired disc in the disc tray.
2 Press **PROGRAM** to start programming.
   → The PROGRAM flag starts flashing.
3 Press **PREV** ⏮ or **NEXT** ⏭ to select the desired track.
4 Press **PROGRAM** to store the track.
- Repeat steps ***3*** to ***4*** to store other tracks.

5 Press **STOP** ■ once to end programming mode.
   → The total number of tracks programmed and total playing time appear on the display.

Notes:
- *If the total playing time is more than "99:59" or if one of the programmed tracks has a number greater than 30, then "- - : - -" appears in the display instead of the total playing time.*
- *During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.*

Playing the program

1 Press **PLAY** ▶ to start program playback.
   → "PLAY PROGRAM" appears on the display.
   → The track number and elapsed playing time of the current track will appear on the display.
- If you press **REPEAT** during program playback, the current track will be played repeatedly.
   → The REPEAT and PROGRAM flags will be displayed.

2 Press **STOP** ■ to stop program playback.

Reviewing the program

Reviewing of the program is only possible in the stop mode.
- Press **PREV** ⏮ or **NEXT** ⏭ repeatedly to review the programmed tracks.
- Press **STOP** ■ to exit review mode.

Erasing the program (in the stop mode)

- Press **CLEAR** on the system.
   → "PROGRAM CLEARED" will be displayed.

Note:
- *The program will be erased when the system is disconnected from the power supply. If the CD tray is opened, the program will be erased and the display will show "PROGRAM CLEARED".*

Shuffle *(only on remote control)*

It will play all the tracks in random order. Shuffle may also be used when tracks are programmed.

To shuffle all the tracks

1 Press **SHUFFLE**.
   → "SHUFFLE" will be displayed.
   → The SHUFFLE flag, the track selected at random appears on the display.
- The tracks will now be played in random order until you press **STOP** ■.
- If you press **REPEAT** during shuffling, the current track will be played repeatedly.
   → The REPEAT and SHUFFLE flags will be displayed.

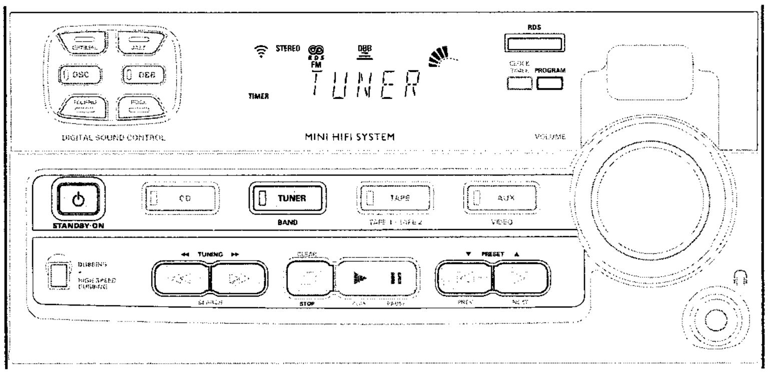
2 Press **SHUFFLE** again to resume normal playback.
   → The SHUFFLE flag disappears from the display.

Repeat *(only on remote control)*

It will play the current track repeatedly.

1 Press **REPEAT** during CD playback.
   → "REPEAT TRACK" will be displayed.
   → The REPEAT flag appears on the display.
- The track will now be played repeatedly until you press **STOP** ■.

2 Press **REPEAT** again to resume normal playback.
   → The REPEAT flag disappears from the display.



Easy Set

EASY SET allows you to store all available radio stations and RDS stations in a particular band (FM, MW or LW) automatically.

1 Press and hold **STANDBY•ON** *(on the system only)* for 2 seconds.
   → "EASY SET" will be displayed and followed by "TUNER".
   → Easy set will start with the last active band.
   → All available radio stations with sufficient signal strength will be stored or until 40 presets are filled.

Searching for RDS stations is only available for model FW326.

2 The system will search once again for the first available RDS station and to set the RDS time automatically.
- When searching RDS station;
   → "SEARCH RDS STATION" will be displayed. If no RDS station is available, the program will exit automatically and "NO RDS STATION" will be displayed.
   → After a station is found, "EASY SET" will be displayed and followed by "TIME".
- When searching RDS time;
   → "SEARCH RDS TIME" will be displayed.
   → When RDS time is read, "RDS TIME" will be displayed. The current time is displayed for 2 seconds and will be stored automatically.

Notes:
- *When EASY SET is used, all previously stored stations will be erased.*
- *The last preset station or the first available RDS will appear on the display when Easy Set is completed.*
- *If RDS station does not transmit RDS time within 90 seconds, the program will exit automatically and the display will show "NO RDS TIME".*

Tuning to radio stations

1 Press **TUNER** to select TUNER mode.
   → "TUNER" will be displayed.
   A few seconds later, the current frequency or the radio station name if available will be displayed.
2 Press **TUNER** (BAND) again to select the desired waveband : FM, MW or LW.
3 Press **TUNING** ◀◀ or ▶▶ for more than one second, then release.
   → The display will show 'SEARCH' until a radio station with sufficient signal strength is found.
- Repeat this procedure until the desired station is reached.
- To tune to a weak station, briefly press **TUNING** ◀◀ or ▶▶ until the display shows the desired frequency and/or when the best reception has been obtained.

Storing Preset Stations

You can store up to 40 radio stations in the memory. When a preset radio station is selected, the preset number appears next to the frequency on the display.

Automatic programming

1. Press **TUNER**.
2. Press **TUNER** (BAND) again to select the desired waveband : FM, MW or LW.
3. Press **PROGRAM** for more than one second.
   → PROGRAM flag starts flashing and 'AUTO' will be displayed.
   → Every available station for the selected waveband will be stored automatically. The frequency and preset number will be displayed briefly.
   → The system will stop searching when all the available radio stations are stored or when the memory for 40 preset radio stations is used.
   → The system will remain tuned to the last stored preset radio station.

- Repeat the above procedure to store other preset radio stations for the other waveband. Remember to select the next available preset number before proceeding. If not, some of the preset radio stations may be erased.

Notes:
- *You can cancel the automatic programming by pressing PROGRAM or STOP ■ (on the system only).*
- *If you want to reserve a section of preset numbers, for example preset numbers 1 to 9, select preset 10 before starting automatic programming: now only the preset numbers 10 to 40 will be programmed.*

Manual programming

1. Press **TUNER**.
2. Press **TUNER** (BAND) to select the desired waveband : FM, MW or LW.
3. Press **PROGRAM** for less than one second.
   → PROGRAM flag, the frequency and preset number start flashing.
   → The next available preset number will be displayed for selection.
4. Press **TUNING** ◀◀ or ▶▶ to tune to the desired frequency.
   - If you wish to store the radio station to another preset number, press **PRESET** ▼ or ▲ to select the desired preset number.
5. Press **PROGRAM** again.
   → PROGRAM flag will stop flashing, and the radio station will be stored.

- Repeat the above procedure to store other preset radio stations.

Notes:
- *When 40 radio stations are stored and you attempt to store another radio station, the display will show " PROGRAM FULL ". If you want to change an existing preset number, repeat steps 4 and 5.*
- *You can cancel manual programming by pressing STOP ■ (on the system only).*
- *During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.*

Tuning to Preset Radio Stations

- Press **PRESET** ▼ or ▲ to select the desired preset number.
  → The preset number, frequency and waveband appear on the display

Receiving RDS radio station

(for model FW326 only)

RDS (Radio Data System) is a broadcasting service that allows FM stations to send additional information along with the regular FM radio signal. This additional information can contain:

- **STATION NAME:** The station name is displayed.
- **FREQUENCY:** The frequency of the station is displayed.
- **PROGRAM TYPE:** The following program types exist and can be received by your tuner: News, Affairs, Info, Sport, Educate, Drama, Culture, Science, Varied, Pop M, Rock M, M.O.R. (middle of the road music), Light M, Classics, Other M, No type.
- **RADIO TEXT (RT):** text messages appear in the display.

When you have tuned to a RDS station, the RDS logo (and the station name will appear on the display:

- The display normally shows the radio station name if available. By repeatedly pressing **RDS** button you can change the type of display information:
  → The display shows in turn:
  STATION NAME → FREQUENCY →
  PROGRAM TYPE → RADIO TEXT →
  STATION NAME ...

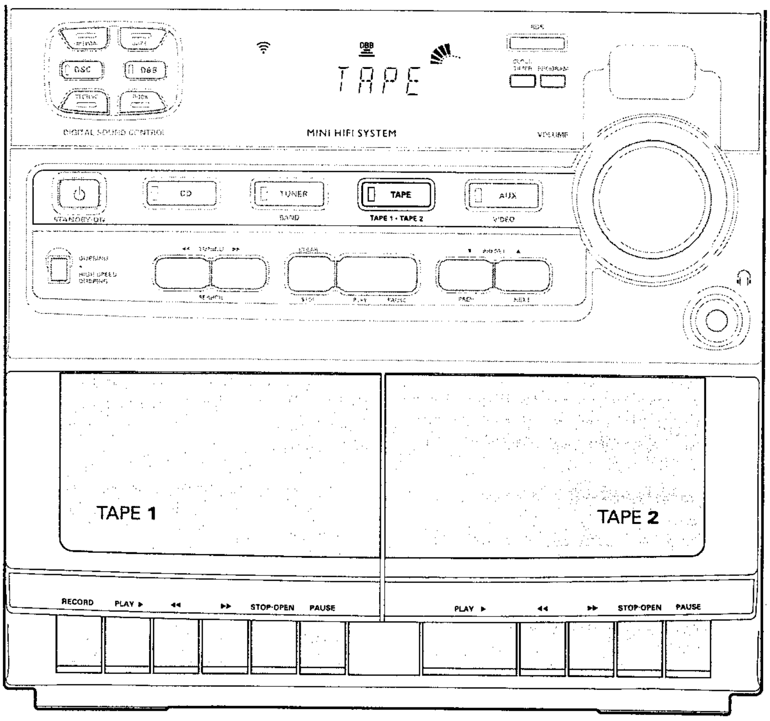
Note:
- *When you press the RDS button and the display shows "NO RDS", it indicates that either the tuned station is not transmitting RDS signal or it is a non RDS station.*

RDS Time

Some RDS station may be transmitting a real time clock at an interval of every minute.

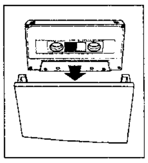
Setting the time with RDS clock

1. Press **CLOCK•TIMER**.
   → "- - : - - " or current time appears on the display.
2. Press **CLOCK•TIMER** once more to enter clock setting mode.
   → "00:00" or current time starts flashing.
3. Press **RDS**.
   → The message "SEARCH RDS TIME" will be displayed.
   → If the station does not transmit RDS clock, "NO RDS TIME" will be displayed.
   → When the RDS clock is read, "RDS TIME" will be displayed. The current clock time is displayed for 2 seconds and will be stored automatically.



TAPE

Loading a tape



- Press **STOP•OPEN**.
- The tape deck door opens.
- Load the tape with the open side downward and the full spool to the left.
- Close the tape deck door.

Tape Playback

1. Press **TAPE** to select TAPE mode.
   → "TAPE" will be displayed.
2. Load the tape into the selected tape deck.
3. Press **PLAY** ▶ to start playback.
   - To interrupt playback, press **PAUSE**.
   - To resume playback, press **PAUSE** again.
4. Press **STOP•OPEN** to end playback.

Rewind/Fast Forward

At the stop mode

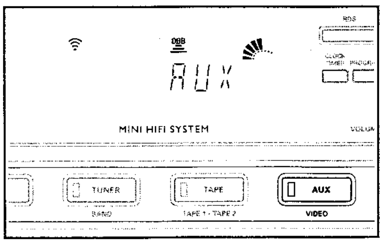
1. You can rewind or fast forward a tape by pressing ◀◀ or ▶▶ respectively.
   → The tape will stop automatically at the end of rewinding or fast forwarding.
2. Press **STOP•OPEN** to stop rewinding or fast forwarding.

Continuous Playback From Tape Deck 2 to Tape Deck 1

1. Press **TAPE** to select TAPE mode.
2. Load the tapes in **tape deck 1** and **2**.
3. Press **PLAY** ▶ on **tape deck 2**.
4. Press **PAUSE** on **tape deck 1**.
5. Press **PLAY** ▶ on **tape deck 1**.
   → Playback will begin with tape deck 2 and will continue with tape deck 1 when playback on tape deck 2 ends.
6. Press **STOP•OPEN** if you want to stop playback before the end of the tape in **tape deck 1** or **tape deck 2**.

Notes:
- *During rewinding or fast forwarding of a tape, it is also possible to select another source mode (e.g. CD, TUNER or AUX mode).*
- *Check and tighten slack tape before use with a pencil. Slack tape may get jammed or may burst in the mechanism.*
- *C-120 tape is extremely thin and is easily deformed or damaged. It is not recommended for use in this system.*
- *Store the tapes at room temperature and do not put them too close to a magnetic field (for example, a transformer, TV or loudspeaker boxes).*

AUX



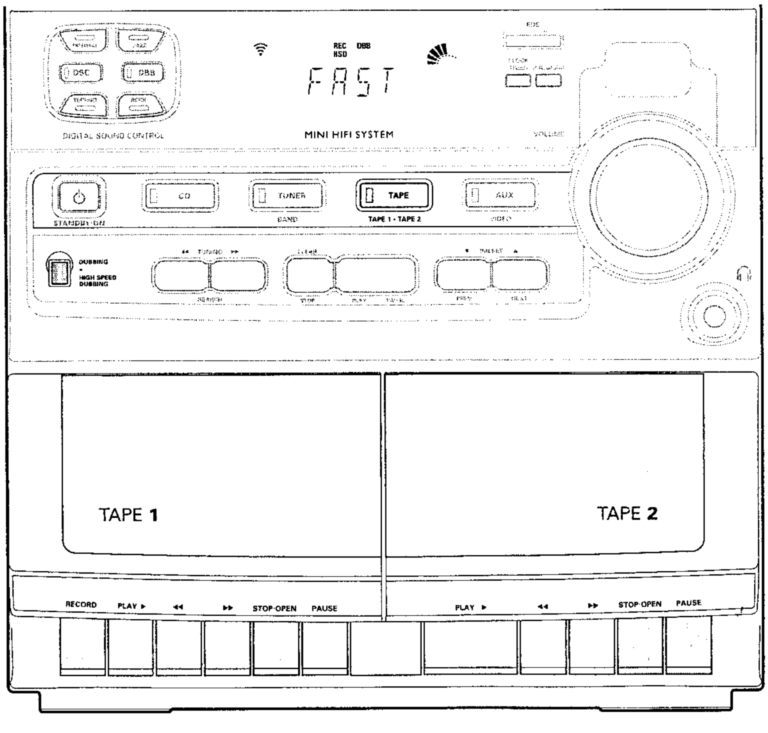
Selecting External Equipment

If you have connected the audio out terminals of the external equipment (TV, VCR, Laser Disc or DVD player) to the AUX IN terminals, you can hear the enhanced sound from the system.

- Press **AUX** to select the external mode.
  → "AUX" will be displayed.

Note:
- *All the sound control features (e.g. DSC, DBB, etc.) are available for selection.*

RECORDING



Notes:
- *For recording, use only tape of IEC type I (normal tape).*
- *The tape is secured at both ends with leader tape. At the beginning and end of tape, nothing will be recorded for six to seven seconds.*
- *The recording level is set automatically, regardless of the position of VOLUME, DBB or Incredible Surround (if available).*
- *To prevent accidental recording, break out the tab on the left shoulder of the tape side you want to protect.*

One Touch Recording

- For One Touch Recording, as soon as you press RECORD, the current source will be recorded on tape deck 1.

1. Load a blank tape in tape deck 1.
2. Press **RECORD** on tape deck 1 to start recording.
   → The REC flag starts flashing.
3. Press **PAUSE** to interrupt recording.
4. Press **STOP•OPEN** on tape deck 1 to stop recording.

Dubbing tapes *(from tape deck 2 to tape deck 1)*

1. Load the prerecorded tape into tape deck 2 and a blank tape into tape deck 1.
   → Make sure that both tapes have their full spool to the left.
2. Press **DUBBING** to switch between normal and high speed dubbing.
   → "NORMAL" (normal speed) or "FAST" (high speed) will be displayed.
   → HSD flag appears on the display for high speed dubbing.

RECORDING

3 Press **PAUSE** on tape deck 1.
4 Press **RECORD** on tape deck 1.
5 Press **PLAY** on tape deck 2.
→ Recording will start automatically.
→ The REC flag starts flashing.
6 Press **STOP•OPEN** on tape deck 1 and tape deck 2 to stop dubbing.

Notes:
- *At the end of side A, flip the tapes to side B and repeat the procedure.*
- *Dubbing of tapes is only possible from tape deck 2 to tape deck 1.*
- *To ensure good dubbing, use tapes of the same length.*
- *During high speed dubbing in Tape mode, the sound is reduced to a low volume.*

CD Synchro Start Recording

During CD synchro start recording,
- It is not advisable to fast forward/rewind your tape in tape deck 2.
- It is not possible to listen to another source.

1 Load a blank tape into tape deck 1 and a disc into the disc tray.
2 Press **CD**.
- You can program the tracks in the order you want them to be recorded (see Programming Tracks). If not, the tracks are recorded according to the disc.

3 Press **RECORD** on tape deck 1 to start recording.
4 Press **STOP•OPEN** on tape deck 1 to stop recording and **STOP ■** to stop CD playback.

Recording from other sources *(only on tape deck 1)*

1 Load a blank tape into tape deck 1.
2 Press **CD**, **TUNER** or **AUX**.
- Start playback of the selected source.

3 Press **RECORD** on tape deck 1 to start recording.
→ The REC flag is flashing.
4 Press **PAUSE** to interrupt recording.
5 Press **STOP•OPEN** on tape deck 1 to stop recording.

Note:
- *During recording, it is not possible to listen to another sound source.*

CLOCK

View Clock

You can view the clock (if it is set) at standby or any source mode. It will be displayed for about 7 seconds.

- Press **CLOCK•TIMER** briefly.
→ " 10:25" (the current time) will be displayed.
→ "--:--" will be displayed if the clock is not set.

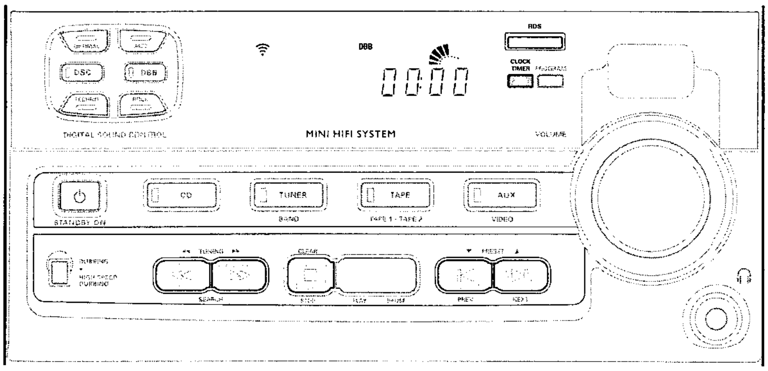
Clock Setting

The clock is set in 24-hour mode, e.g. "00:00" or "23:59". Before setting the clock, you must be in the View Clock mode.

1 Press **CLOCK•TIMER** to select clock mode.
→ "00:00" or the current time starts flashing.
→ "◀◀, ▶▶, I◀, ▶I, ■ light up *(for models FW325 and FW326 only)*.
2 Set the hour with ◀◀ or ▶▶.
3 Set the minute with I◀ or ▶I.
4 Press **CLOCK•TIMER** again to store the setting.
→ The clock starts running.
- To exit without storing the setting, press **STOP ■**.

Notes:
- *During clock setting, if no button is pressed within 90 seconds, the system will exit clock setting mode automatically.*
- *When a power interruption occurs, the clock setting is erased.*
- *To set the time with RDS clock, see "Receiving RDS Radio Station" under TUNER section. (for model FW326 only)*

TIMER



Timer Setting

- The system can switch on to CD or TUNER mode automatically at a preset time. It can serve as an alarm to wake you up. After half an hour from the preset time, the system will return to the standby mode if no button is pressed.
- Before setting the timer, make sure the clock is set correctly.
- The timer has to be reset or start again for each subsequent preset time.
- **The volume of the timer will be at the last setting before the set is switched to standby mode.**

1 Press and hold **CLOCK•TIMER** for more than 2 seconds to select timer mode.
→ "ON 00:00" or the last set timer starts flashing. The TIMER flag flashes.
→ The last selected source is lighted while other available sources are flashing.
→ "◀◀, ▶▶, I◀, ▶I, ■" light up *(for models FW325 and FW326 only)*.
2 Press **CD** or **TUNER** to select the desired source.
3 Press ◀◀ or ▶▶ to set the hour for the timer to start.
4 Press I◀ or ▶I to set the minute for the timer to start.
5 Press **CLOCK•TIMER** to store the start time.
→ The TIMER is now set.
→ The TIMER flag remains on the display.
- To exit without storing the setting, press **STOP ■**.
- At the preset time, the TIMER will be activated.
→ The selected source will be played.
→ The TIMER flag disappears from the display.

Notes:
- *During timer setting, if no button is pressed within 90 seconds, the system will exit timer setting mode automatically.*
- *If the source selected is TUNER, the last tuned frequency will be switched on.*
- *If the source selected is CD, the first track of the disc will be played. If the CD tray is empty, the TUNER source will be selected instead.*

To cancel the TIMER
1 Press **CLOCK•TIMER** for more than 2 seconds.
2 Press **PAUSE II** to cancel the timer.
→ "CANCEL" will be displayed.
→ The TIMER flag disappears from the display.

To start the TIMER again *(for the same time)*
1 Press **CLOCK•TIMER** for more than 2 seconds.
2 Press **CLOCK•TIMER** again to store the start time and the selected source.

TROUBLESHOOTING

English

Warning! Under no circumstances should you try to repair the system yourself, as this will invalidate the warranty.

- If a fault occurs, check the points listed below before taking the system for repair.
- Should any problems persist after you have made these checks, consult your nearest dealer or service center.

CD Player Operation

"NO DISC" is displayed.

- The disc is inserted upside down.
- → *Place CD with printed side up.*
- Moisture condensation.
- → *Wait until lens has adjusted to normal room temperature.*
- There is no disc in the CD tray.
- → *Insert a CD.*
- The CD is dirty, badly scratched or warped.
- → *Clean or replace the CD.*

Radio Reception

Poor radio reception

- The signal strength is too weak.
- → *Adjust the antenna.*
- The TV or VCR is too close to the stereo system.
- → *Separate the stereo system from the TV or VCR.*
- → *Connect an external antenna for better reception.*

Tape Deck Operation

"RECORDING ACTIVE" is displayed.

- A recording is in progress.
- → *Stop the recording or wait until it is finished.*

"TAPE DUBBING ONLY" is displayed.

- Tape dubbing is only possible in tape mode.
- → *Switch source to tape mode.*

Recording or playback cannot be made or there is a decrease in audio level.

- *Dirty tape heads, capstans or pressure rollers.*
- → *See section on tape deck maintenance.*
- Magnetic build-up in the record/playback head.
- → *Use demagnetizing tape.*

General

System does not react when any button is pressed.

- Electrostatic discharge.
- → *Press STANDBY-ON to switch the system off. Remove the AC power plug from the wall outlet, then reconnect and switch on the system again.*

No or poor sound.

- Volume is not turned up.
- → *Adjust VOLUME.*
- The headphones are connected.
- → *Disconnect the headphones.*
- Speakers are not connected or are connected wrongly.
- → *Check that the speakers are connected correctly.*
- → *Make sure that the stripped speaker wire is clamped.*

Reversed left and right sound.

- Speakers are connected wrongly.
- → *Check the speaker connections and location.*

Lack of bass sound or apparently imprecise physical location of musical instruments.

- Speakers are connected wrongly.
- → *Check the speaker connection for proper phasing, red/black wires to red/black terminals.*

Remote control has no effect on the system.

- The distance to the system is too large.
- → *Reduce the distance.*
- Batteries are inserted incorrectly.
- → *Insert the batteries with their polarities (+/– signs) as indicated..*
- Batteries are exhausted.
- → *Replace the batteries.*
- Wrong source is selected.
- → *Select the source (CD, TUNER, etc.) before pressing the function button, (PLAY, PREV/NEXT, etc.).*

Timer not working.

- Timer is not switched on.
- → *Press CLOCK•TIMER to switch on the timer.*
- Dubbing/recording is in progress.
- → *Stop dubbing/recording.*

System displays features automatically; buttons flash continuously.

- Demonstration mode is switched on.
- → *Press and hold STOP ■ for 3 seconds to switch off the demonstration.*

ADDITIONAL FEATURES *(For /21/21M only)*

English

Adjusting the Operating Voltage

Before connecting the AC power cord to the wall outlet, make sure that the voltage selector at the rear of the system is set to the local power line voltage. If not, reset the selector before connecting to the wall outlet.

Changing the MW tuning grid

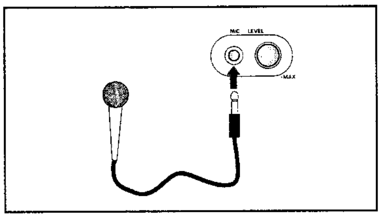
The frequency step can be changed if necessary. In North and South America, the frequency step between adjacent channels in the MW band is 10 kHz. In other parts of the world, it is 9 kHz. The frequency step preset in the factory is 9 KHz.

For MW Band
To change from 9 kHz to 10 kHz or vice versa

Changing of tuning grid will erase all previously stored preset stations.

1 Disconnect the system from the AC power supply *(pull out the AC power cord).*
2 Press and hold **TUNER** and **TUNING ▶▶** while reconnecting the system to the AC power supply.
  → Display will show "GRID 10" or "GRID 9".

Notes:
- *GRID 9 indicates that the tuning grid is in step of 9 kHz in MW band. GRID 10 indicates that the tuning grid is in step of 10 kHz in MW band.*
- *FM tuning grid will also be changed from 50 kHz to 100 kHz or vice versa. All preset stations will also be erased.*



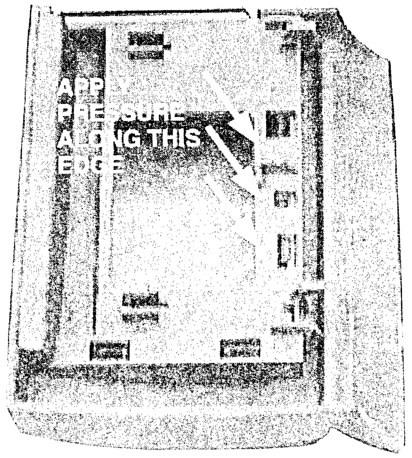
Microphone Mixing

(not available for model FW306)

1 Set the **MIC LEVEL** control to the minimum level to prevent acoustic feedback (e.g. a loud howling sound) before you connect the microphone.
2 Connect a microphone to the **MIC** socket.
3 Press **CD**, **TUNER**, **TAPE** or **AUX**.
4 Play the selected source.
5 Adjust the volume level with **VOLUME** control.
6 Adjust the **MIC LEVEL** control to the mixing level that you want.
7 Start singing or talking through the microphone.

DISMANTLING INSTRUCTIONS

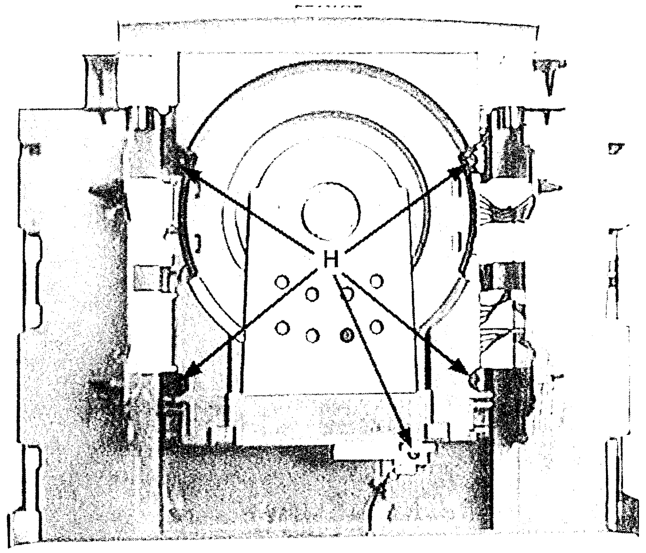
Dismantling of the Cassette Cover



Cassette door

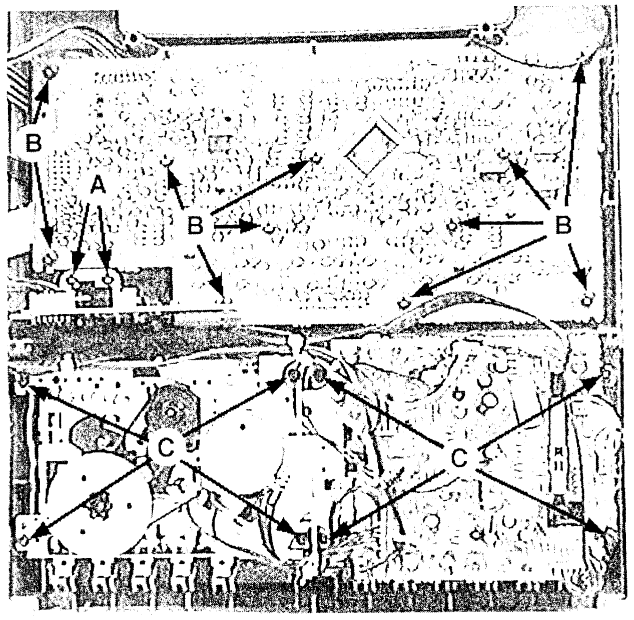
Dismantling of the Front Panel

1) Loosen the 6 screws to separate the Front Panel from the rear portion.
    - 2 screws each on the left & right side
    - 2 screws at the bottom
2) Pull out the CD Short Loader assembly from the Rear Cabinet (pos 280).
3) Remove 5 screws H to separate the CD Short Loader Module from the bracket (pos 312).



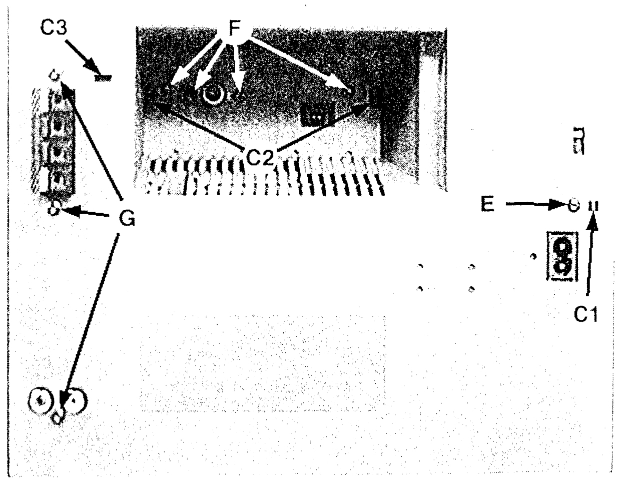
Dismantling of Assemblies on the Front Panel

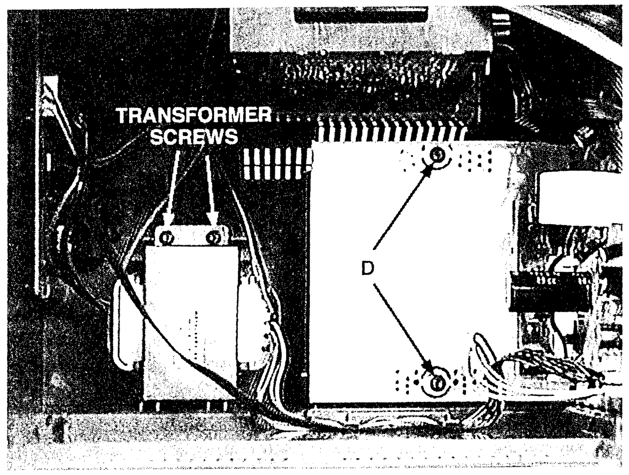
1) Remove 2 screw A to loosen the Karaoke board.
2) Remove 11 screws B as indicated to loosen the Front board.
3) Remove 8 screws C to loosen the MTF Module



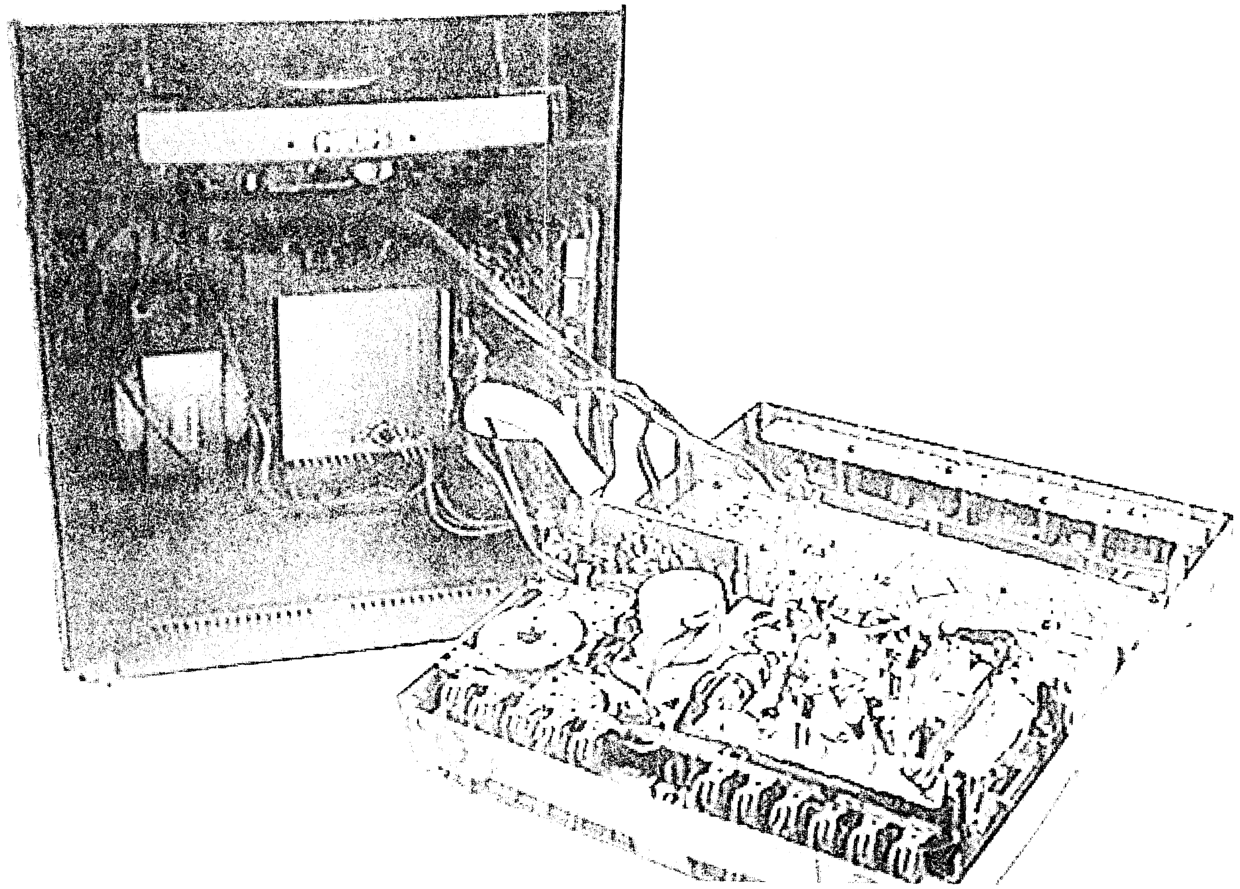
Dismantling of Rear Portion

1) Remove 1 screw E & uncatch C1 to loosen the Mains socket pc board.
3) Remove 4 screws F & uncatch C2 to loosen the Tuner pc board assembly.
4) Remove 5 screws (3x screw G and 2x screw D on the heatsink) & uncatch C3 to loosen the Combi board (Main part).

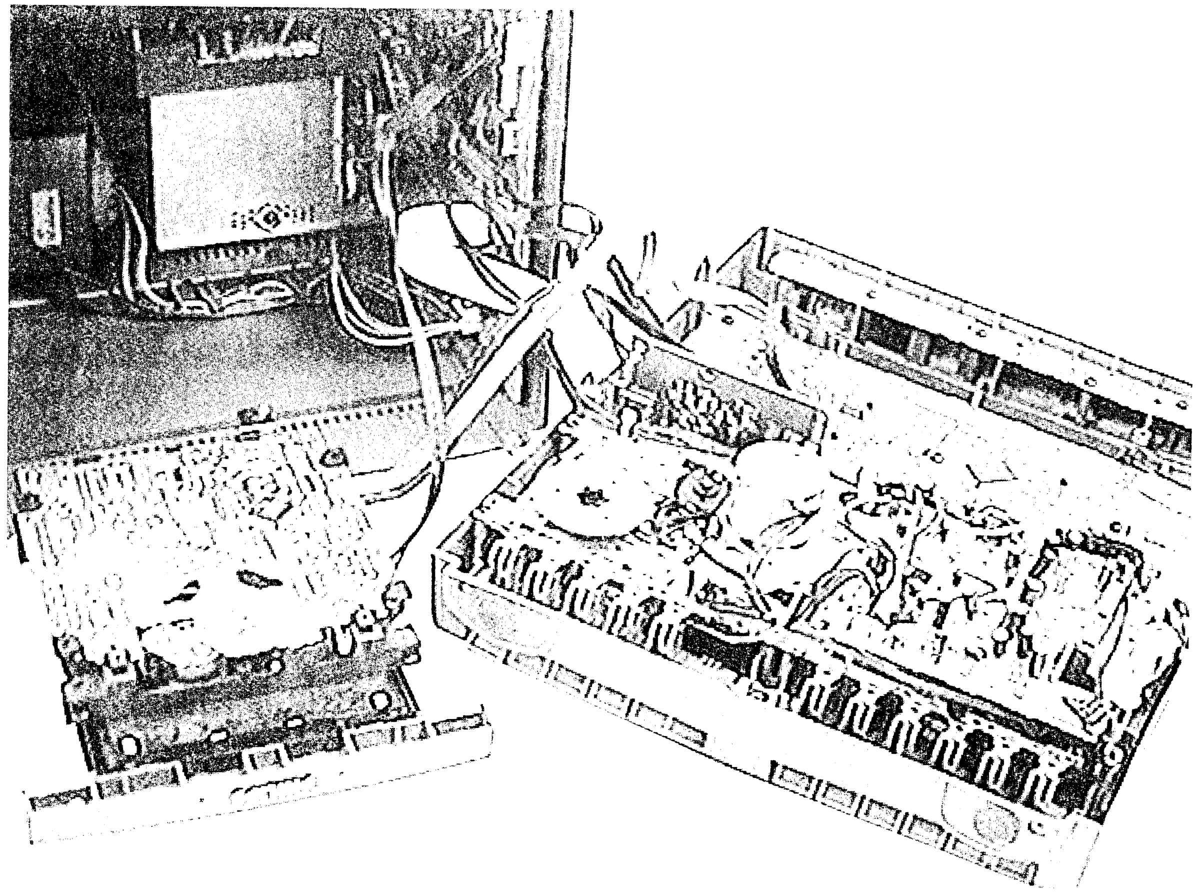




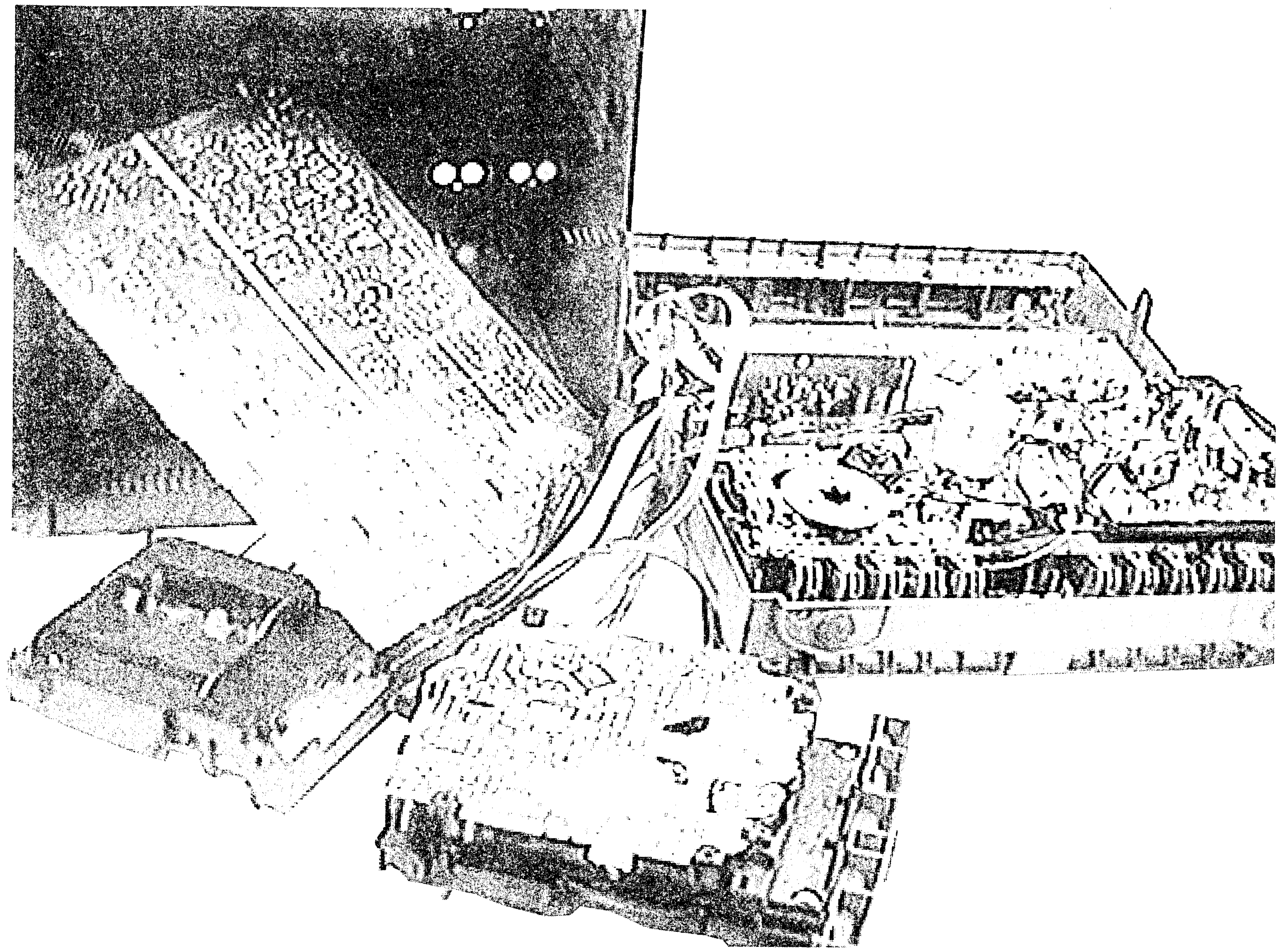
Service pos A



Service pos B

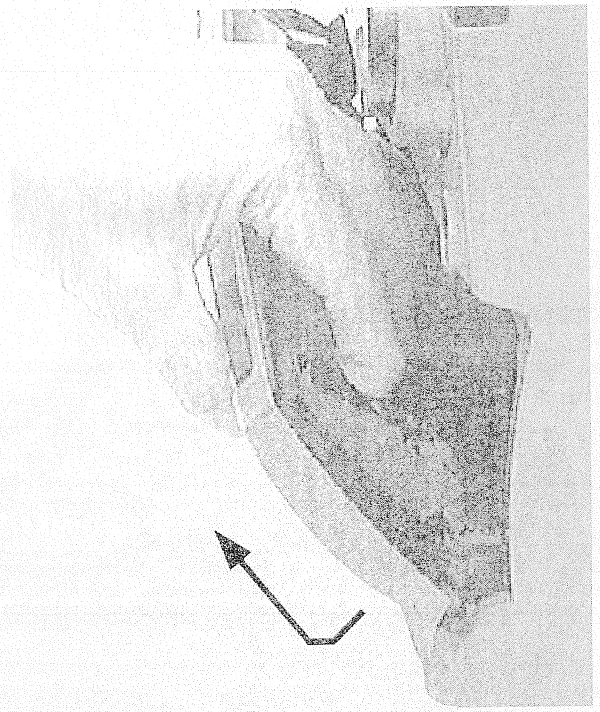


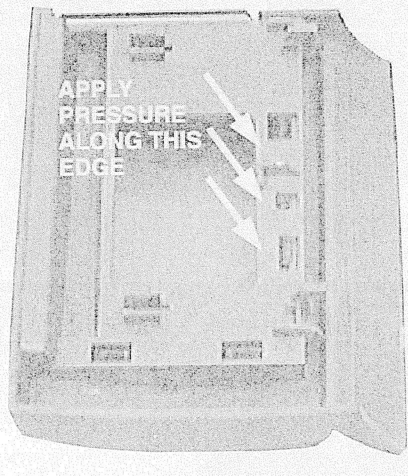
Service pos C



DISMANTLING INSTRUCTIONS

Dismantling of the Cassette Cover

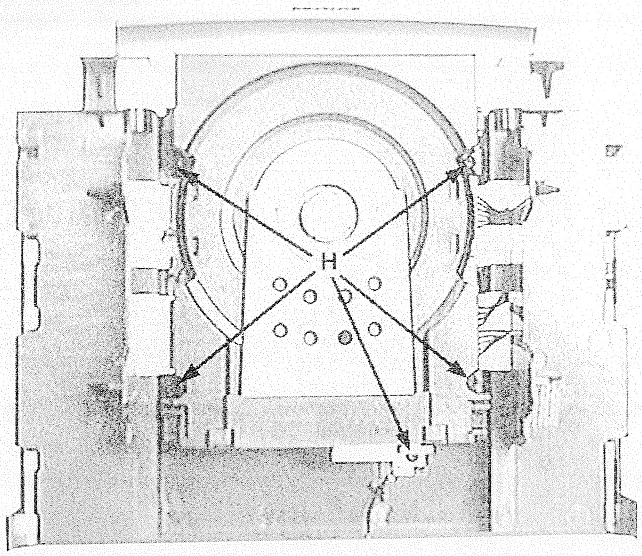




Cassette door

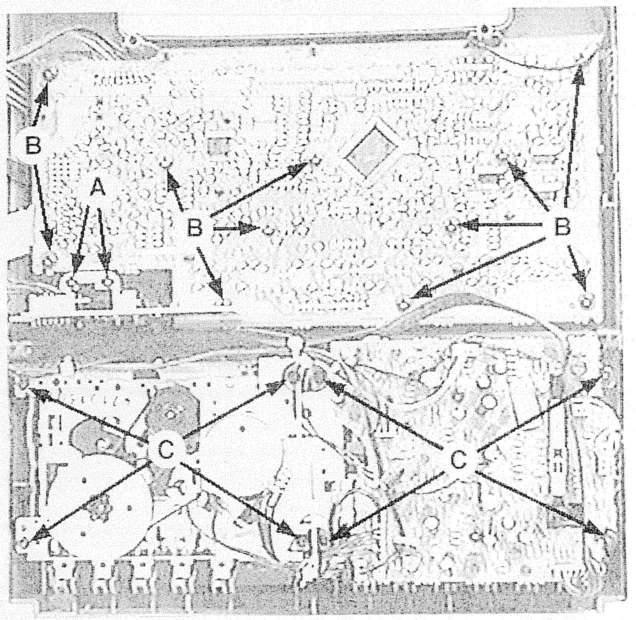
Dismantling of the Front Panel

1) Loosen the 6 screws to separate the Front Panel from the rear portion.
    - 2 screws each on the left & right side
    - 2 screws at the bottom
2) Pull out the CD Short Loader assembly from the Rear Cabinet (pos 280).
3) Remove 5 screws H to separate the CD Short Loader Module from the bracket (pos 312).



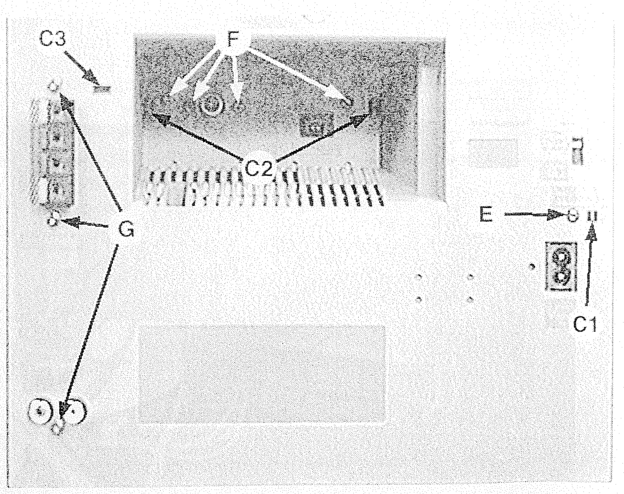
Dismantling of Assemblies on the Front Panel

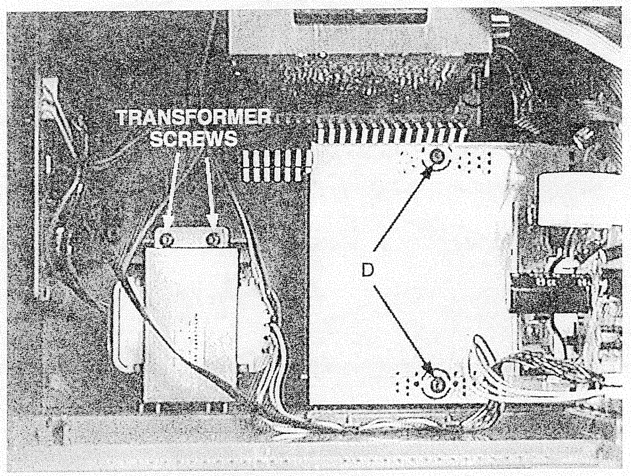
1) Remove 2 screw A to loosen the Karaoke board.
2) Remove 11 screws B as indicated to loosen the Front board.
3) Remove 8 screws C to loosen the MTF Module



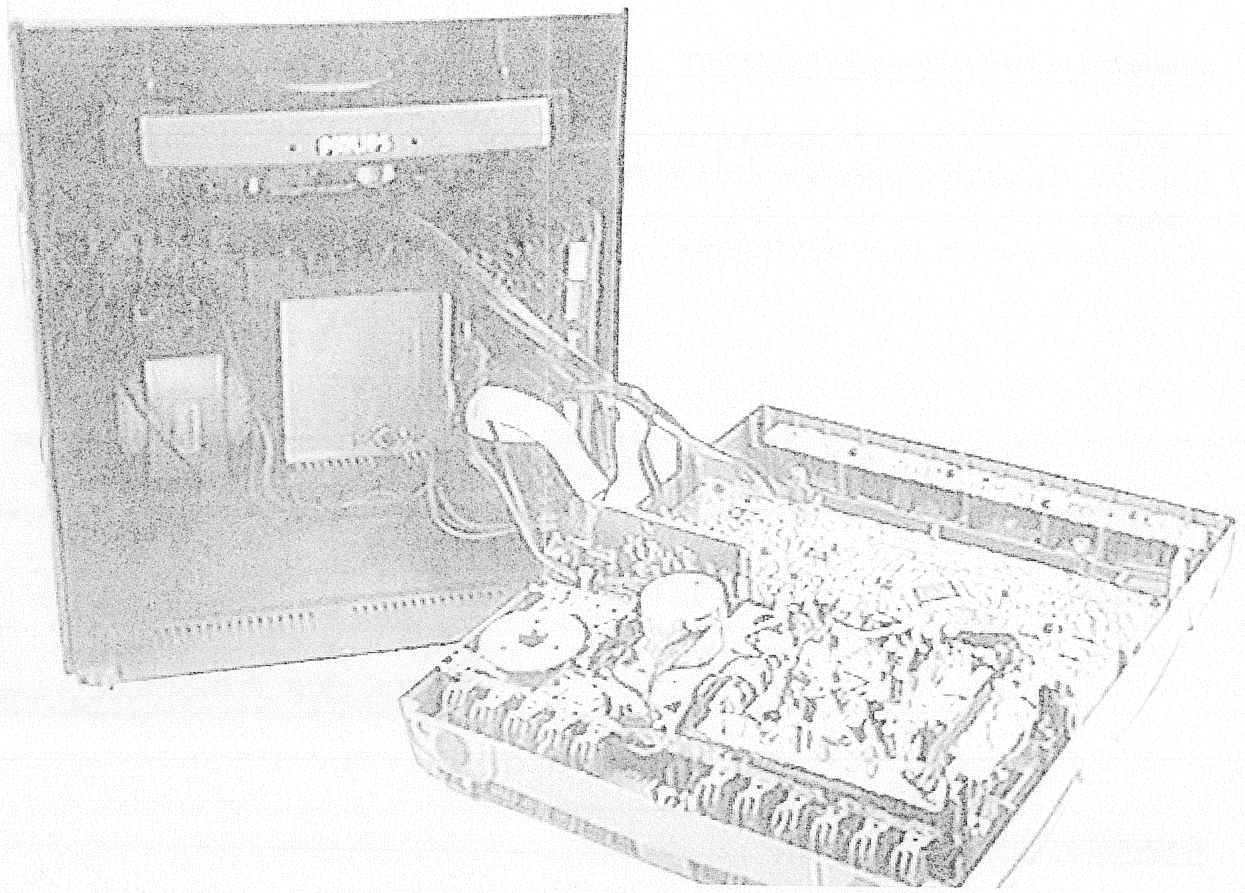
Dismantling of Rear Portion

1) Remove 1 screw E & uncatch C1 to loosen the Mains socket pc board.
3) Remove 4 screws F & uncatch C2 to loosen the Tuner pc board assembly.
4) Remove 5 screws (3x screw G and 2x screw D on the heatsink) & uncatch C3 to loosen the Combi board (Main part).

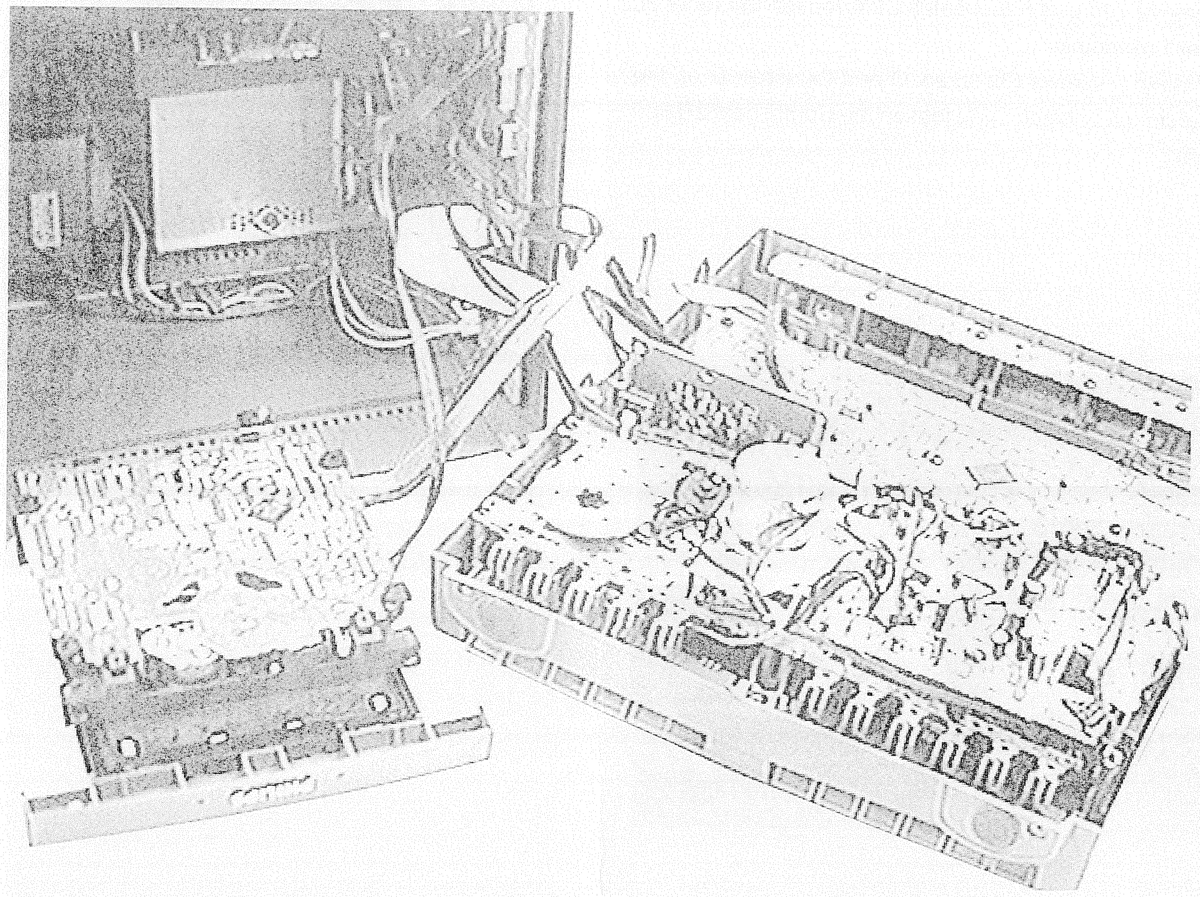




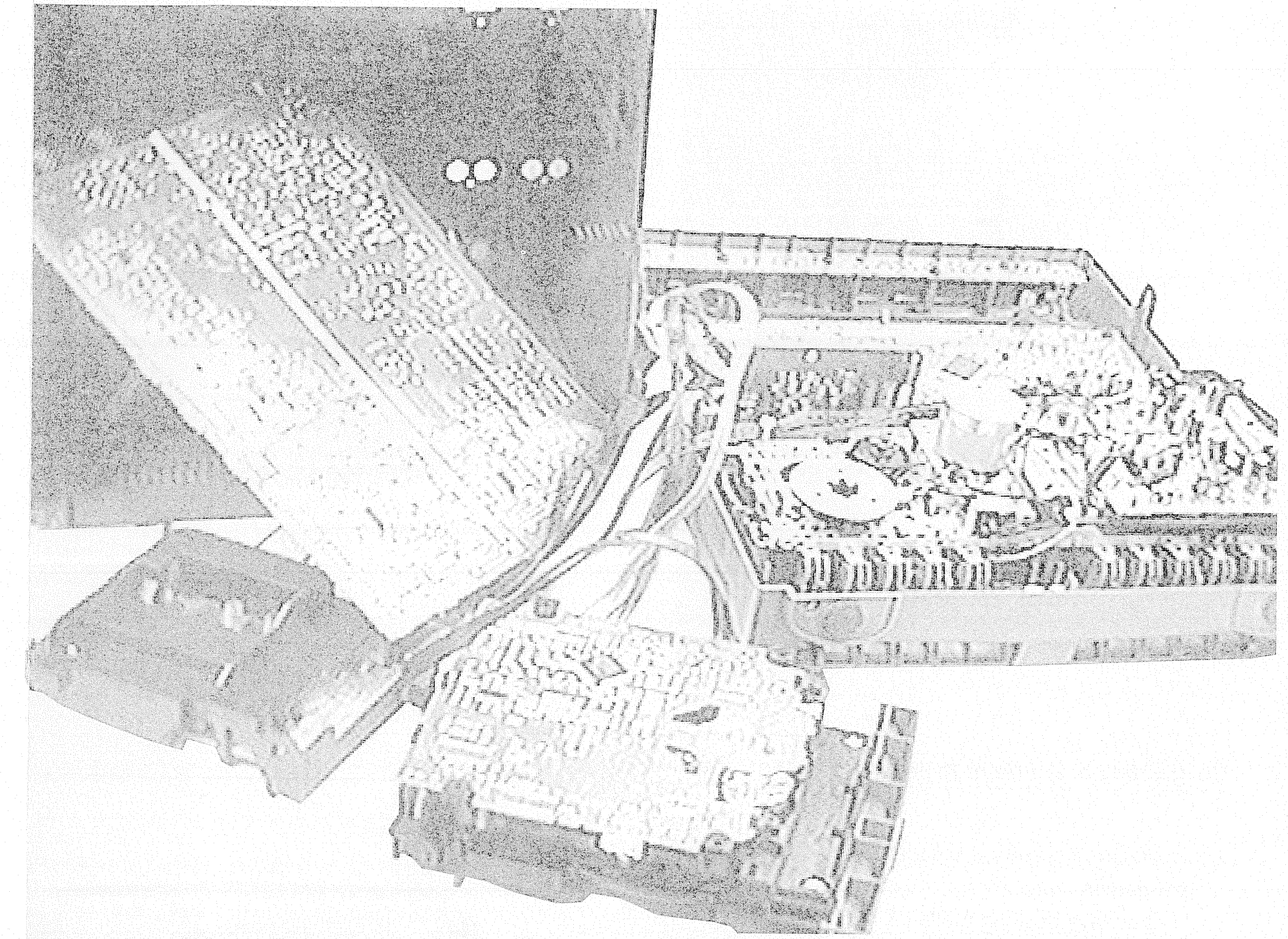
Service pos A



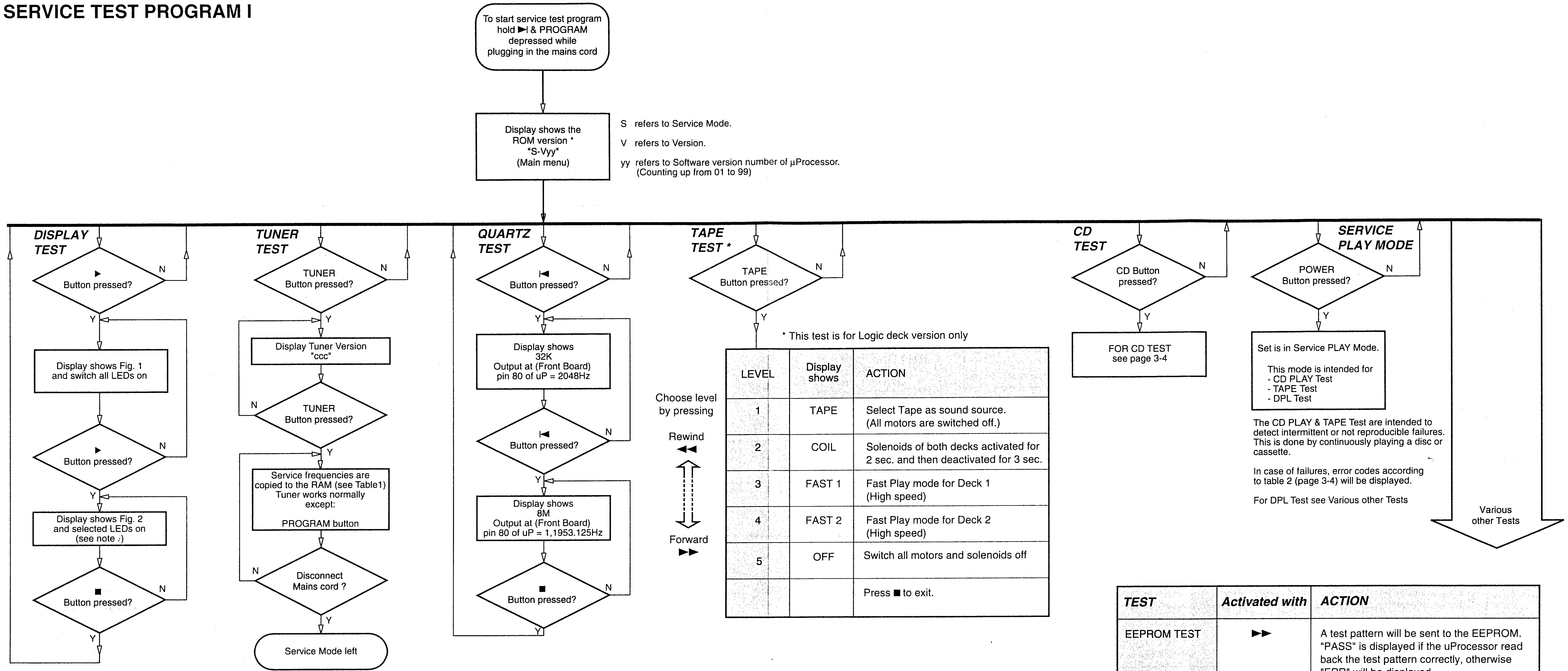
Service pos B



Service pos C



SERVICE TEST PROGRAM I


To start service test program hold ▶| & PROGRAM depressed while plugging in the mains cord
Display shows the ROM version * "S-Vyy" (Main menu)
DISPLAY TEST
▶ Button pressed?
N
Y
Display shows Fig. 1 and switch all LEDs on
▶ Button pressed?
Display shows Fig. 2 and selected LEDs on (see note ⁄)
■ Button pressed?
TUNER TEST
TUNER Button pressed?
Display Tuner Version "ccc"
TUNER Button pressed?
Service frequencies are copied to the RAM (see Table1) Tuner works normally except: PROGRAM button
Disconnect Mains cord ?
Service Mode left
QUARTZ TEST
|◀ Button pressed?
Display shows 32K Output at (Front Board) pin 80 of uP = 2048Hz
|◀ Button pressed?
Display shows 8M Output at (Front Board) pin 80 of uP = 1,1953.125Hz
■ Button pressed?
TAPE TEST *
TAPE Button pressed?
Choose level by pressing
Rewind ◀◀
Forward ▶▶
CD TEST
CD Button pressed?
FOR CD TEST see page 3-4
SERVICE PLAY MODE
POWER Button pressed?
Set is in Service PLAY Mode.
This mode is intended for
- CD PLAY Test
- TAPE Test
- DPL Test
Various other Tests

S refers to Service Mode.

V refers to Version.

yy refers to Software version number of µProcessor. (Counting up from 01 to 99)

* This test is for Logic deck version only

LEVEL	Display shows	ACTION
1	TAPE	Select Tape as sound source. (All motors are switched off.)
2	COIL	Solenoids of both decks activated for 2 sec. and then deactivated for 3 sec.
3	FAST 1	Fast Play mode for Deck 1 (High speed)
4	FAST 2	Fast Play mode for Deck 2 (High speed)
5	OFF	Switch all motors and solenoids off
		Press ■ to exit.

The CD PLAY & TAPE Test are intended to detect intermittent or not reproducible failures. This is done by continuously playing a disc or cassette.

In case of failures, error codes according to table 2 (page 3-4) will be displayed.

For DPL Test see Various other Tests

PRESET	Europe "EUR"	East Eur. 3-band "EAS"	East Eur. 2-band "EAS"	USA "USA"	Oversea "OSE"	Korea "KOR"	Japan "JAP"
1	87.5MHz	65.81MHz	65.81MHz	87.5MHz	87.5MHz	87.5MHz	76MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz	108MHz	CH3 107.75MHz
3	531kHz	74MHz	74MHz	530kHz	531/530kHz	531kHz	90MHz
4	1602kHz	87.5MHz	87.5MHz	1700kHz	1602/1700kHz	1602kHz	CH1 95.75MHz
5	558kHz	531kHz	531kHz	560kHz	558/560kHz	558kHz	CH2 101.75MHz
6	1494kHz	1602kHz	1602kHz	1500kHz	1494/1500kHz	1494kHz	531kHz
7	153kHz	558kHz	558kHz	98MHz	87.5MHz	87.5MHz	1602kHz
8	279kHz	1494kHz	1494kHz	87.5MHz	87.5MHz	87.5MHz	558kHz
9	198kHz	153kHz	98MHz	87.5MHz	87.5MHz	87.5MHz	1494kHz
10	98MHz	279kHz	70.01MHz	87.5MHz	87.5MHz	87.5MHz	80MHz
11	87.5MHz	198kHz	65.81MHz	87.5MHz	98MHz	98MHz	76MHz

Table 1

East Europe TUNER IF offset correction

1) Input a reference frequency 87.5MHz from the generator.

2) Proceed to the Tuner Test Mode

3) Hold TUNER button down for > 3 seconds

4) The set will self-calibrate automatically and display "OFS-xx" when calibration is successful, otherwise it will display "00E".

xx : offset value between -3 to +3

Note: This has to be done whenever the Eeprom, Microprocessor or the components in the oscillator circuitry are replaced.

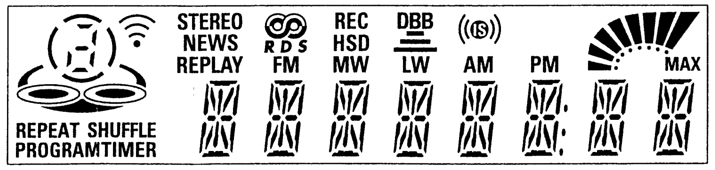
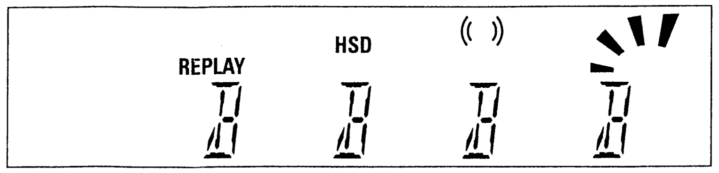

STEREO
NEWS
REPLAY
RDS
FM
REC
HSD
MW
DBB
LW
AM
PM
MAX
REPEAT SHUFFLE
PROGRAMTIMER

Figure 1



note ⁄ : CDC1, CDC3, Tuner, Optimal, Rock, ◀◀, ■ and |◀.

Figure 2

TEST	***Activated with***	***ACTION***
EEPROM TEST	▶▶ ■ to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "ERR" will be displayed.
EEPROM FORMAT	◀◀	Load default data. Display shows "NEW" for 1 second. ***Caution!*** ***All presets from the customer will be lost!!***
KEY TEST	▶| ■ to Exit	Key numbers according table 3 are shown on the display. (see Chapter 3-4)
FAST CLOCK TEST	CLOCK/TIMER	The clock is switched to fast mode. "FAST" is displayed for 1 sec. Press CLOCK/TIMER again to reset the clock to normal. "NORMAL" displayed for 1 sec.
VOLUME TEST	Volume Knob	Display shows volume value for 2 seconds. Volume increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached.
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	

Error code	Type	Error Description
E1000	W	Focus Error Triggered when the focus could not be found within a certain time when starting up the CD or when the focus is lost for a certain time during play.
E1001	W	Radial Error Triggered when the radial servo is off-track for a certain time during play.
E1002	W	Sledge In Error The sledge did not reach its inner position (inner-switch is still close) before approximately 6 Sec. have passed. Inner-switch or sledge motor problem.
E1003	W	Sledge Out Error The sledge did not come out of its inner position (inner-switch is still open) before approximately 250 mSec. have passed by. Inner-switch or sledge motor problem.
E1005	W	Jump-offtrack error Triggered in normal play when the jump destination could not be found within a certain time.
E1006	W	Subcode Error (no subcode within time) Triggered when a new subcode was missing for a certain time during play.
E1007	W	PLL Error The Phase Lock Loop could not lock within a certain time.
E1008	W	Turntable Motor Error Generated when the CD could not reached 75% of speed during startup within a certain time. Discmotor problem.
E1020	F	Focus Search Error The focus point has not been found within a certain time.
E1070	W	The carousel switch is not open within time. This can happen when either the switch is defective and closed all the time, or when the carousel is blocked when located exactly at a disc position.
E1071	W	The carousel position switch did not close within a certain time. This can happen when the switch is defective and never closes electrically, or when the carousel is blocked in between two disc positions. The time-out is approximately 5 Sec.
E1079	W	The drawer could not enter the inside position is opening again. This can be caused because the drawer is blocked by something and cannot go fully inside, or the drawer switch is defective and does not close.
E2020	F	Head Movement Error Deck 1 Generated if the head does not reach the desired position within a certain time.
E2021	F	Head Movement Error Deck 2 Generated if the head does not reach the desired position within a certain time.

F = Fatal error & the set stop play function W = Warning

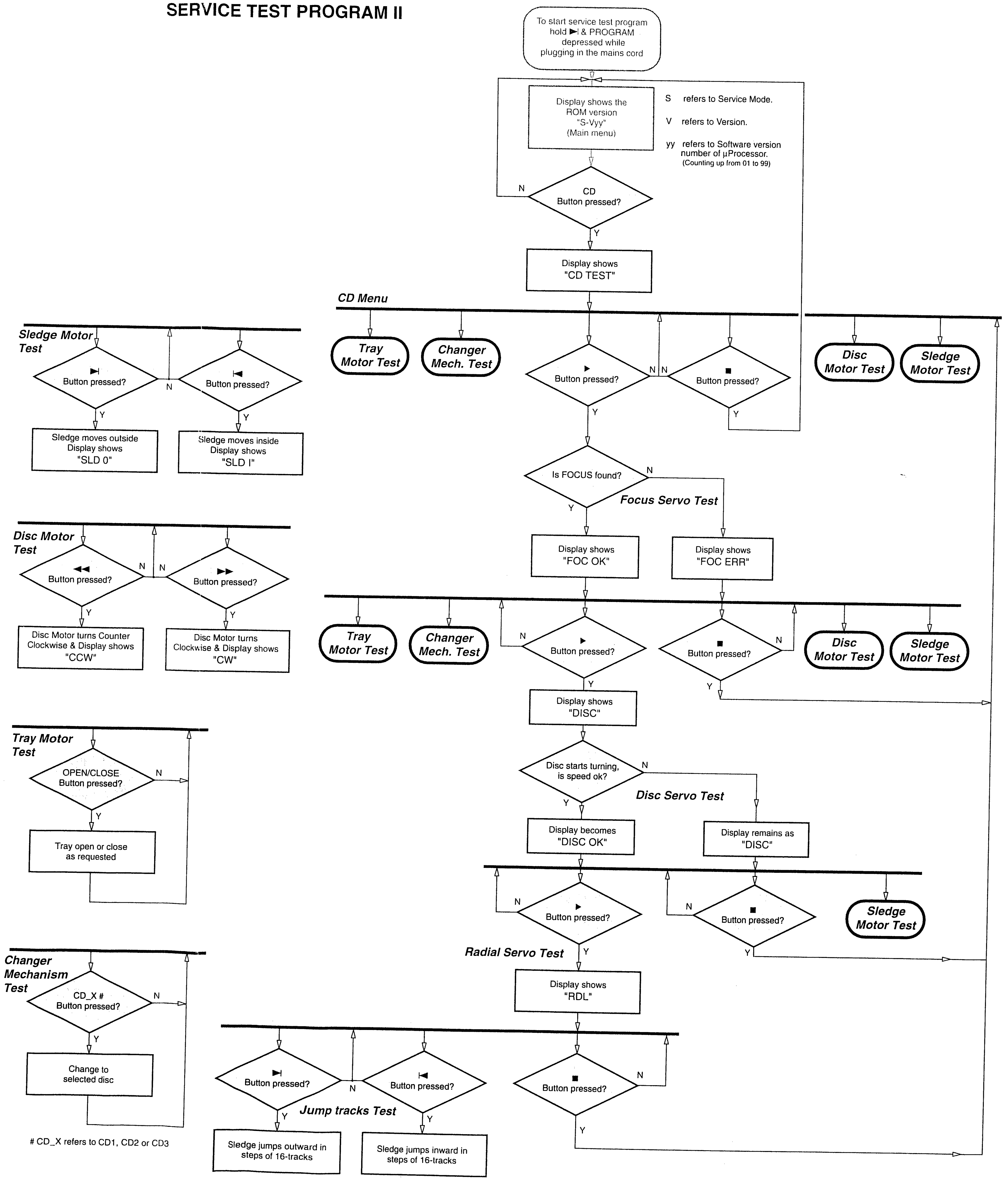
Table 2

Keys activated	Display shows	Keys activated	Display shows	Keys activated	Display shows
No Key pressed	--	CLOCK /TIMER	10	RECORD *	21
Any Remote control key	RC	PROGRAM	11	REPLAY *	22
CD1 *	1	INCRSURROUND *	12	◀◀	23
CD2 *	2	VOLUME UP *	13	▶▶	24
CD3 *	3	VOLUME DOWN *	14	■	Exit
CHANGE CD	4	STANDBY - ON	15	▶II	26
OPEN / CLOSE	5	CD	16	I◀	27
DSC	6	TUNER	17	▶I	28
DBB	7	TAPE	18		
RDS *	8	AUX	19		
NEWS *	9	HSD	20		

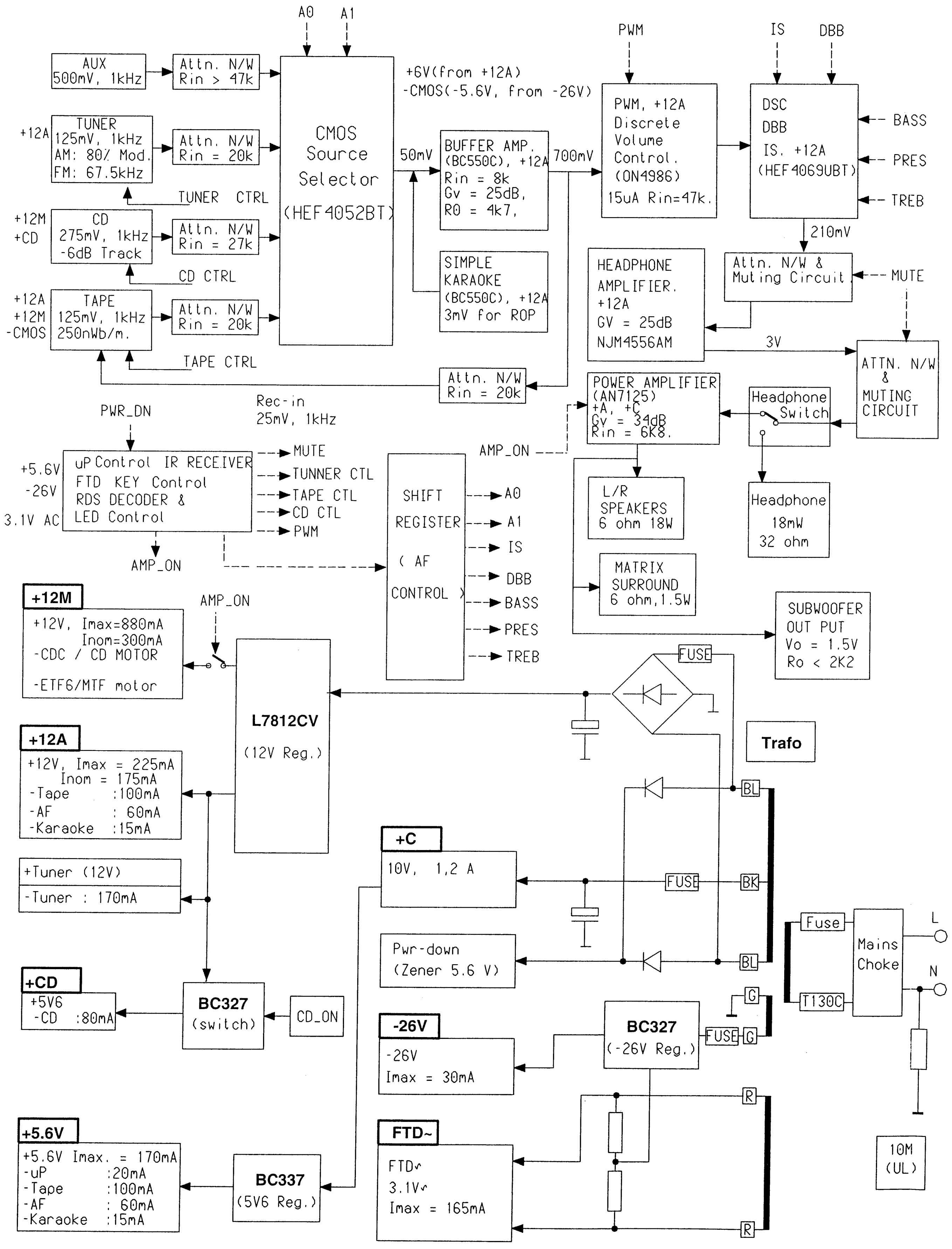
* Not for all type/version

Table 3

SERVICE TEST PROGRAM II

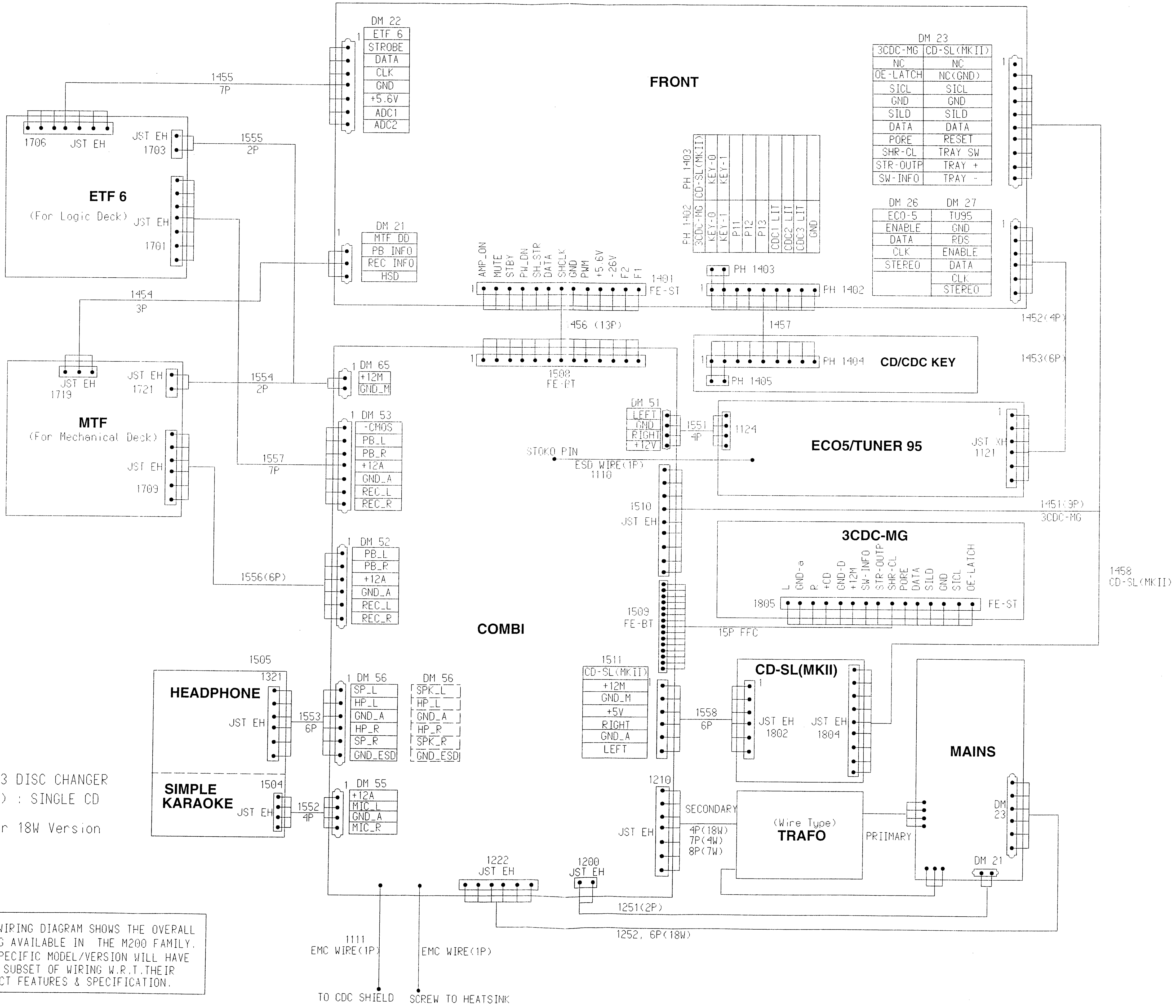

To start service test program hold ▶I & PROGRAM depressed while plugging in the mains cord
Display shows the ROM version "S-Vyy" (Main menu)
S refers to Service Mode.
V refers to Version.
yy refers to Software version number of µProcessor. (Counting up from 01 to 99)
CD Button pressed?
N
Y
Display shows "CD TEST"
CD Menu
Tray Motor Test
Changer Mech. Test
▶ Button pressed?
■ Button pressed?
Disc Motor Test
Sledge Motor Test
Is FOCUS found?
Focus Servo Test
Display shows "FOC OK"
Display shows "FOC ERR"
Display shows "DISC"
Disc starts turning, is speed ok?
Disc Servo Test
Display becomes "DISC OK"
Display remains as "DISC"
Radial Servo Test
Display shows "RDL"
▶I Button pressed?
I◀ Button pressed?
Jump tracks Test
Sledge jumps outward in steps of 16-tracks
Sledge jumps inward in steps of 16-tracks
Sledge Motor Test
Sledge moves outside Display shows "SLD 0"
Sledge moves inside Display shows "SLD I"
Disc Motor Test
◀◀ Button pressed?
▶▶ Button pressed?
Disc Motor turns Counter Clockwise & Display shows "CCW"
Disc Motor turns Clockwise & Display shows "CW"
Tray Motor Test
OPEN/CLOSE Button pressed?
Tray open or close as requested
Changer Mechanism Test
CD_X # Button pressed?
Change to selected disc
# CD_X refers to CD1, CD2 or CD3

SET BLOCK DIAGRAM


A0
A1
AUX
500mV, 1kHz
Attn. N/W
Rin > 47k
+12A
TUNER
125mV, 1kHz
AM: 80% Mod.
FM: 67.5kHz
Attn. N/W
Rin = 20k
TUNER CTRL
+12M
+CD
CD
275mV, 1kHz
-6dB Track
Attn. N/W
Rin = 27k
CD CTRL
+12A
+12M
-CMOS
TAPE
125mV, 1kHz
250nWb/m.
Attn. N/W
Rin = 20k
TAPE CTRL
CMOS
Source
Selector
(HEF4052BT)
+6V(from +12A)
-CMOS(-5.6V, from -26V)
50mV
BUFFER AMP.
(BC550C), +12A
Rin = 8k
Gv = 25dB,
R0 = 4k7,
700mV
SIMPLE
KARAOKE
(BC550C), +12A
3mV for ROP
Attn. N/W
Rin = 20k
Rec-in
25mV, 1kHz
PWM
PWM, +12A
Discrete
Volume
Control.
(ON4986)
15uA Rin=47k.
IS
DBB
DSC
DBB
IS. +12A
(HEF4069UBT)
BASS
PRES
TREB
210mV
Attn. N/W &
Muting Circuit
MUTE
HEADPHONE
AMPLIFIER.
+12A
GV = 25dB
NJM4556AM
3V
ATTN. N/W
&
MUTING
CIRCUIT
POWER AMPLIFIER
(AN7125)
+A, +C
Gv = 34dB
Rin = 6K8.
Headphone
Switch
AMP_ON
L/R
SPEAKERS
6 ohm 18W
Headphone
18mW
32 ohm
MATRIX
SURROUND
6 ohm,1.5W
SUBWOOFER
OUT PUT
Vo = 1.5V
Ro < 2K2
PWR_DN
+5.6V
-26V
3.1V AC
uP Control IR RECEIVER
FTD KEY Control
RDS DECODER &
LED Control
MUTE
TUNNER CTL
TAPE CTL
CD CTL
PWM
AMP_ON
SHIFT
REGISTER
(AF
CONTROL)
A0
A1
IS
DBB
BASS
PRES
TREB
+12M
+12V, Imax=880mA
Inom=300mA
-CDC / CD MOTOR
-ETF6/MTF motor
AMP_ON
L7812CV
(12V Reg.)
FUSE
Trafo
+12A
+12V, Imax = 225mA
Inom = 175mA
-Tape :100mA
-AF : 60mA
-Karaoke :15mA
+Tuner (12V)
-Tuner : 170mA
BL
+C
10V, 1,2 A
FUSE
BK
Fuse
Mains
Choke
L
N
Pwr-down
(Zener 5.6 V)
BL
T130C
+CD
+5V6
-CD :80mA
BC327
(switch)
CD_ON
-26V
-26V
Imax = 30mA
BC327
(-26V Reg.)
FUSE
G
G
R
+5.6V
+5.6V Imax. = 170mA
-uP :20mA
-Tape :100mA
-AF : 60mA
-Karaoke :15mA
BC337
(5V6 Reg.)
FTD~
FTD~
3.1V~
Imax = 165mA
R
10M
(UL)

NOTES:

SET WIRING DIAGRAM


FRONT
DM 22
ETF 6
STROBE
DATA
CLK
GND
+5.6V
ADC1
ADC2
1455
7P
1706
JST EH
JST EH
1703
1555
2P
ETF 6
(For Logic Deck)
JST EH
1701
DM 21
MTF DD
PB INFO
REC INFO
HSD
1454
3P
AMP_ON
MUTE
STBY
PW_DN
SH_STR
DATA
SHCLK
GND
PWM
+5.6V
-26V
F2
F1
1401
FE-ST
PH 1403
CD-SL(MKII)
KEY-0
KEY-1
PH 1402
3CDC-MG
KEY-0
KEY-1
P11
P12
P13
CDC1 LIT
CDC2 LIT
CDC3 LIT
GND
PH 1403
PH 1402
DM 23
3CDC-MG
CD-SL(MKII)
NC
NC
OE-LATCH
NC(GND)
SICL
SICL
GND
GND
SILD
SILD
DATA
DATA
PORE
RESET
SHR-CL
TRAY SW
STR-OUTP
TRAY +
SW-INFO
TRAY -
DM 26
DM 27
ECO-5
TU95
ENABLE
GND
DATA
RDS
CLK
ENABLE
STEREO
DATA
CLK
STEREO
1452(4P)
1456 (13P)
1457
PH 1404
CD/CDC KEY
PH 1405
1453(6P)
1508
FE-BT
JST EH
1719
JST EH
1721
MTF
(For Mechanical Deck)
JST EH
1709
1554
2P
DM 65
+12M
GND_M
DM 53
-CMOS
PB_L
PB_R
+12A
GND_A
REC_L
REC_R
1557
7P
DM 51
LEFT
GND
RIGHT
+12V
1551
4P
1124
ECO5/TUNER 95
JST XH
1121
STOKO PIN
ESD WIPE(1P)
1110
1510
JST EH
1451(3P)
3CDC-MG
3CDC-MG
L
GND-a
R
+CD
GND-D
+12M
SW-INFO
STR-OUTP
SHR-CL
PORE
DATA
SILD
GND
SICL
OE-LATCH
1805
FE-ST
1458
CD-SL(MKII)
DM 52
PB_L
PB_R
+12A
GND_A
REC_L
REC_R
1556(6P)
1509
FE-BT
15P FFC
COMBI
1505
1321
HEADPHONE
JST EH
1553
6P
DM 56
SP_L
HP_L
GND_A
HP_R
SP_R
GND_ESD
DM 56
SPK_L
HP_L
GND_A
HP_R
SPK_R
GND_ESD
1511
CD-SL(MKII)
+12M
GND_M
+5V
RIGHT
GND_A
LEFT
CD-SL(MKII)
1558
6P
JST EH
1802
JST EH
1804
MAINS
SIMPLE KARAOKE
1504
JST EH
1552
4P
DM 55
+12A
MIC_L
GND_A
MIC_R
1210
JST EH
SECONDARY
4P(18W)
7P(4W)
8P(7W)
(Wire Type)
TRAFO
PRIIMARY
DM 23
DM 21
1222
JST EH
1200
JST EH
1251(2P)
1252, 6P(18W)
1111
EMC WIRE(1P)
EMC WIRE(1P)
TO CDC SHIELD
SCREW TO HEATSINK

3CDC-MG : 3 DISC CHANGER
CD-SL(MKII) : SINGLE CD
[ ] : For 18W Version

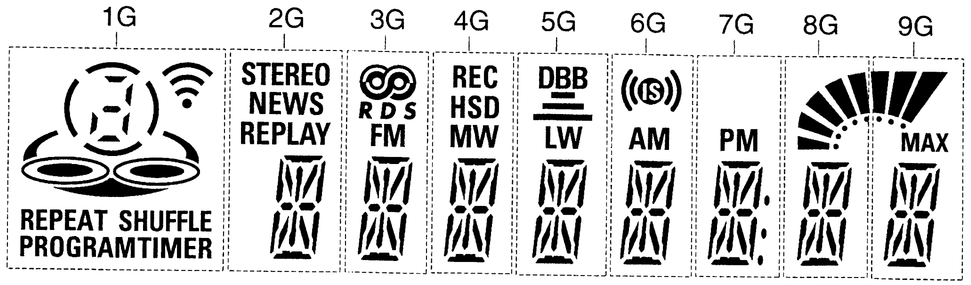
NB : THIS WIRING DIAGRAM SHOWS THE OVERALL WIRING AVAILABLE IN THE M200 FAMILY. THE SPECIFIC MODEL/VERSION WILL HAVE THEIR SUBSET OF WIRING W.R.T.THEIR PRODUCT FEATURES & SPECIFICATION.

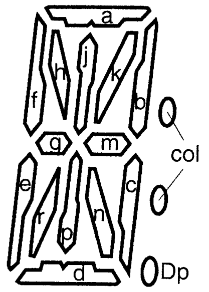
FRONT BOARD

TABLE OF CONTENTS

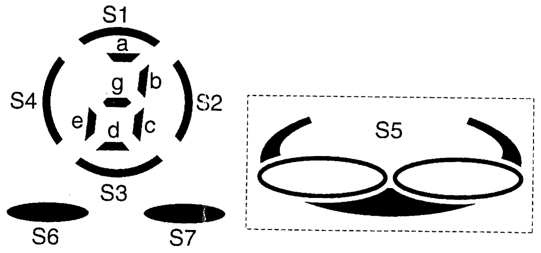
LCD pin connection 6-1
Component & Chip layout 6-2
Circuit diagram.. 6-3
Electrical parts list... 6-4

LCD DISPLAY PIN CONNECTIONS

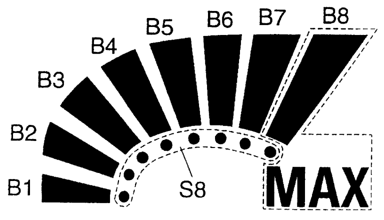

1G
2G
3G
4G
5G
6G
7G
8G
9G
STEREO
NEWS
REPLAY
RDS
FM
REC
HSD
MW
DBB
LW
AM
PM
MAX
REPEAT SHUFFLE
PROGRAMTIMER


a
h
j
k
f
b
g
m
col
e
c
r
p
n
d
Dp

(2G~9G)


S1
a
g
b
S4
S2
e
d
c
S3
S5
S6
S7

(1G)


B1
B2
B3
B4
B5
B6
B7
B8
S8
MAX

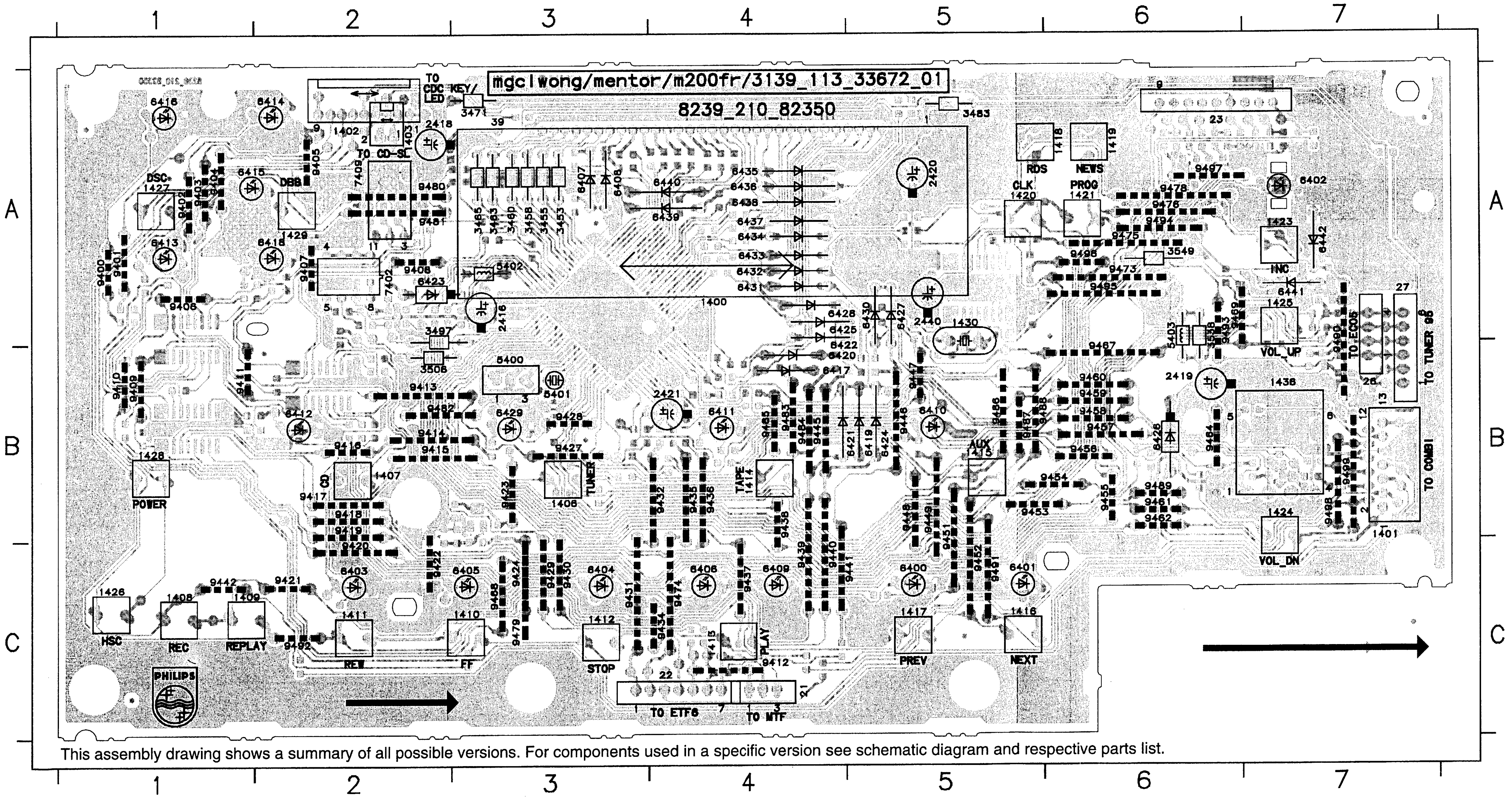
(8G , 9G)

	1G	2G	3G	4G	5G	6G	7G	8G	9G
P1	S1	a	a	a	a	a	a	a	a
P2	S2	h	h	h	h	h	h	h	h
P3	S3	j , p	j , p	j , p	j , p	j , p	j , p	j , p	j , p
P4	S4	k	k	k	k	k	k	k	k
P5	b	b	b	b	b	b	b	b	b
P6	c	f	f	f	f	f	f	f	f
P7	a , d , g	m	m	m	m	m	m	m	m
P8	e	g	g	g	g	g	g	g	g
P9	S5	c	c	c	c	c	c	c	c
P10	S6	e	e	e	e	e	e	e	e
P11	S7	r	r	r	r	r	r	r	r
P12	**SHUFFLE**	n	n	n	n	n	n	n	n
P13	**REPEAT**	d	d	d	d	d	d	d	d
P14	**TIMER**	**STEREO**	RDS	**REC**	**DBB**	IS	**PM**	S8	
P15	**PROGRAM**	**REPLAY**	**FM**	**HSD**	≡	(( ))	col	B5	
P16	📶	**NEWS**	-	**MW**	**LW**	**AM**	Dp	B6	
P17	-	-	-	-	-	-	-	B1	-
P18	-	-	-	-	-	-	-	B2	-
P19	-	-	-	-	-	-	-	B3	-
P20	-	-	-	-	-	-	-	B4	-
P21	-	-	-	-	-	-	-	-	B7
P22	-	-	-	-	-	-	-	-	B8

NOTES:

COMPONENT LAYOUT

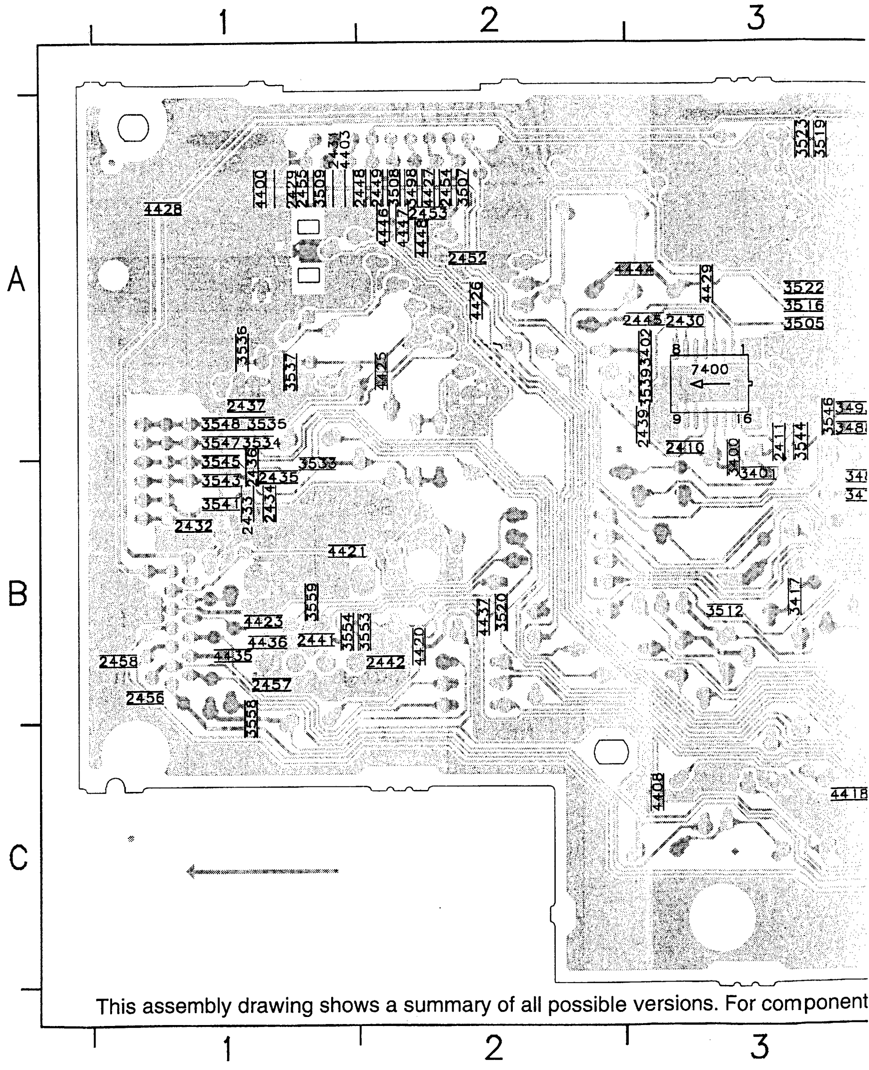
21	C4	1407	B2	1417	C5	1428	B1	3453	A3	3538	A6	6404	C3	6414	A2	6424	B5	6434	A4	7409	A2	9409	B1	9419	B2	9431	C3	9442	C1	9455	B6	9468	C3	9482	B2	9492	C2
22	C4	1408	C1	1418	A6	1429	A2	3455	A3	3549	A6	6405	C3	6415	A1	6425	A4	6435	A4	9400	A1	9410	B1	9420	C2	9432	B4	9445	B4	9456	B6	9469	A6	9483	B4	9493	A6
23	A6	1409	C1	1419	A6	1430	A5	3458	A3	5400	B3	6406	C4	6416	A1	6426	B6	6436	A4	9401	A1	9411	B1	9421	C2	9434	C4	9446	B5	9457	B6	9473	A6	9484	B4	9494	A6
26	B7	1410	C3	1420	A5	1436	B7	3460	A3	5401	B3	6407	A3	6417	B4	6427	A5	6437	A4	9402	A1	9412	C4	9422	C2	9435	B4	9447	B5	9458	B6	9474	C4	9485	B4	9495	A6
27	A7	1411	C2	1421	A6	2416	A3	3463	A3	5402	A3	6408	A3	6418	A2	6428	A4	6438	A4	9403	A1	9413	B2	9423	B3	9436	B4	9448	B5	9459	B6	9475	A6	9486	B5	9496	A6
1400	A4	1412	C3	1423	A7	2418	A2	3465	A3	5403	A6	6409	C4	6419	B5	6429	B3	6439	A4	9404	A1	9414	B2	9424	C3	9437	C4	9449	B5	9460	B6	9476	A6	9487	B5	9497	A6
1401	B7	1413	C4	1424	B7	2419	B6	3471	A3	6400	C5	6410	B5	6420	B4	6430	A5	6440	A4	9405	A2	9415	B2	9427	B3	9438	B4	9451	B5	9461	B6	9478	A6	9488	B5	9498	B7
1402	A2	1414	B4	1425	A7	2420	A5	3483	A5	6401	C5	6411	B4	6421	B5	6431	A4	6441	A7	9406	A1	9416	B2	9428	B3	9439	C4	9452	C5	9462	B6	9479	C3	9489	B6	9499	B7
1403	A2	1415	B5	1426	C1	2421	B4	3497	A2	6402	A7	6412	B2	6422	B4	6432	A4	6442	A7	9407	A2	9417	B2	9429	C3	9440	C4	9453	B5	9464	B6	9480	A2	9490	A7		
1406	B3	1416	C5	1427	A1	2440	A5	3506	B2	6403	C2	6413	A1	6423	A2	6433	A4	7402	A2	9408	A2	9418	B2	9430	C3	9441	C5	9454	B6	9467	B6	9481	A2	9491	C5		


1
2
3
4
5
6
7
A
B
C
mgclwong/mentor/m200fr/3139_113_33672_01
8239_210_82350
TO CDC KEY/ LED
TO CD-SL
DSC
DBB
RDS
NEWS
CLK
PROG
INC
VOL_UP
VOL_DN
TO ECO5
TO TUNER 98
TO COMBI
POWER
CD
TUNER
TAPE
AUX
HSC
REC
REPLAY
REW
FF
STOP
PLAY
PREV
NEXT
TO ETF6
TO MTF
PHILIPS

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

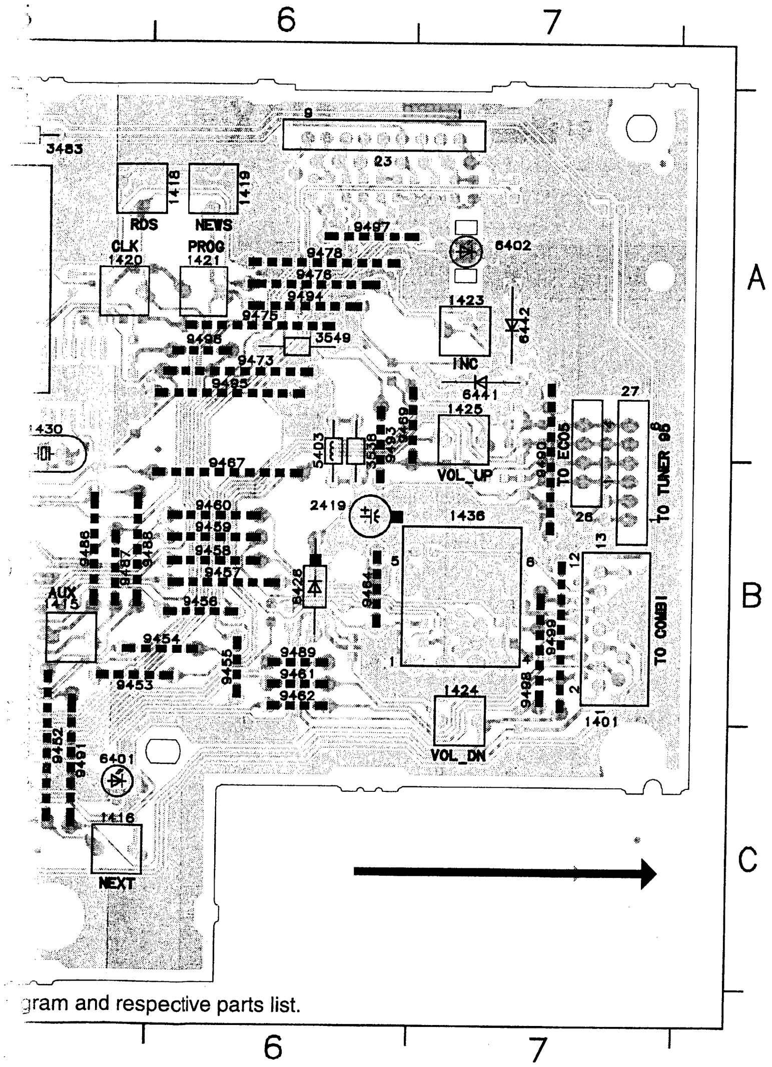
CHIP LAYOUT

2408	B5	2427	A6	2441	B1	2457	B1	3411	B6	3424	A4	3437	A4	3449	A7
2409	B5	2428	B5	2442	B2	2458	B1	3412	A6	3425	A4	3438	A4	3451	A7
2410	A3	2429	A1	2443	B5	3400	B3	3413	B6	3426	A4	3439	A4	3452	A7
2411	A3	2430	A3	2444	A6	3401	B3	3414	A6	3427	A4	3440	A4	3454	B4
2412	B7	2431	A1	2445	A3	3402	A3	3415	A6	3428	A4	3441	A4	3456	B4
2414	A6	2432	B1	2448	A2	3403	B6	3416	B6	3429	A4	3442	A4	3457	A7
2415	B4	2433	B1	2449	A2	3405	A6	3417	B3	3430	A4	3443	A4	3459	B4
2422	C5	2434	B1	2452	A2	3406	A6	3419	B4	3431	B4	3444	A4	3462	B4
2423	B5	2435	B1	2453	A2	3407	B7	3420	A5	3433	B7	3445	A4	3464	B4
2424	B5	2436	B1	2454	A2	3408	B6	3421	A4	3434	A5	3446	B4	3467	B3
2425	B5	2437	A1	2455	A1	3409	B6	3422	A4	3435	A5	3447	B4	3469	A5
2426	A6	2439	A3	2456	B1	3410	A6	3423	A4	3436	A5	3448	A7	3472	A5


1
2
3
A
B
C
4428
7400
2410
2430
2437
2432
2458
2456
2457
2442
4421
3512

This assembly drawing shows a summary of all possible versions. For component

9419	B2	9431	C3	9442	C1	9455	B6	9468	C3	9482	B2	9492	C2
9420	C2	9432	B4	9445	B4	9456	B6	9469	A6	9483	B4	9493	A6
9421	C2	9434	C4	9446	B5	9457	B6	9473	A6	9484	B4	9494	A6
9422	C2	9435	B4	9447	B5	9458	B6	9474	C4	9485	B4	9495	A6
9423	B3	9436	B4	9448	B5	9459	B6	9475	A6	9486	B5	9496	A6
9424	C3	9437	C4	9449	B5	9460	B6	9476	A6	9487	B5	9497	A6
9427	B3	9438	B4	9451	B5	9461	B6	9478	A6	9488	B5	9498	B7
9428	B3	9439	C4	9452	C5	9462	B6	9479	C3	9489	B6	9499	B7
9429	C3	9440	C4	9453	B5	9464	B6	9480	A2	9490	A7		
9430	C3	9441	C5	9454	B6	9467	B6	9481	A2	9491	C5		

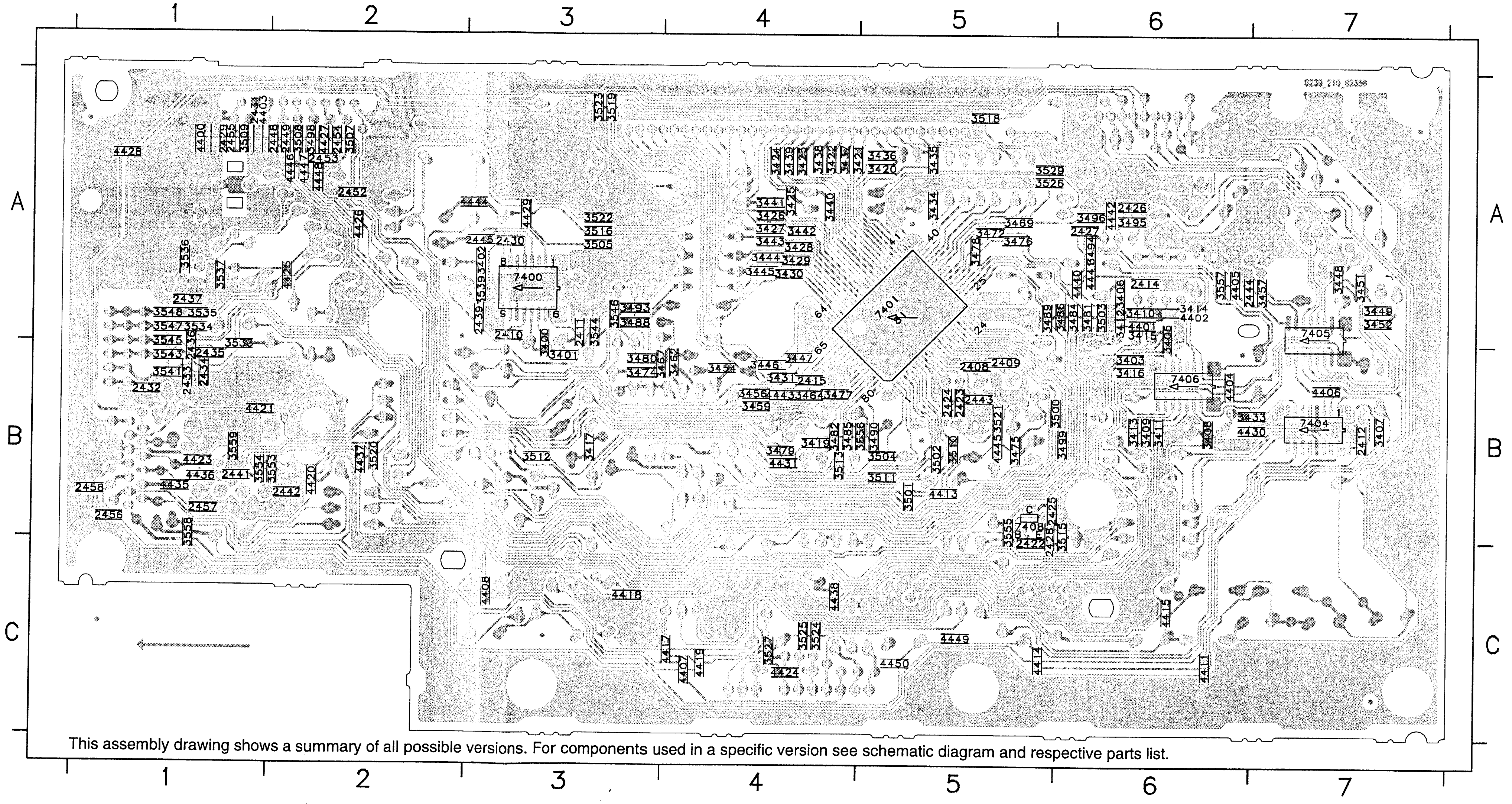

6
7
A
B
C
3483
RDS
1418
NEWS
1419
CLK
1420
PROG
1421
6402
1423
INC
6442
6441
1425
VOL_UP
27
TO ECO5
TO TUNER 98
1430
2419
1436
TO COMBI
AUX
1415
1424
VOL_DN
1401
6401
1416
NEXT
3549
9478
9476
9473
9495
9467
9460
9459
9458
9457
9456
9454
9453
9455
9489
9461
9462
9487
6426
5403

gram and respective parts list.

CHIP LAYOUT

2408	B5	2427	A6	2441	B1	2457	B1	3411	B6	3424	A4	3437	A4	3449	A7	3474	B3
2409	B5	2428	B5	2442	B2	2458	B1	3412	A6	3425	A4	3438	A4	3451	A7	3475	B5
2410	A3	2429	A1	2443	B5	3400	B3	3413	B6	3426	A4	3439	A4	3452	A7	3476	A5
2411	A3	2430	A3	2444	A6	3401	B3	3414	A6	3427	A4	3440	A4	3454	B4	3477	B4
2412	B7	2431	A1	2445	A3	3402	A3	3415	A6	3428	A4	3441	A4	3456	B4	3478	A5
2414	A6	2432	B1	2448	A2	3403	B6	3416	B6	3429	A4	3442	A4	3457	A7	3479	B4
2415	B4	2433	B1	2449	A2	3405	A6	3417	B3	3430	A4	3443	A4	3459	B4	3480	B3
2422	C5	2434	B1	2452	A2	3406	A6	3419	B4	3431	B4	3444	A4	3462	B4	3481	A6
2423	B5	2435	B1	2453	A2	3407	B7	3420	A5	3433	B7	3445	A4	3464	B4	3482	B4
2424	B5	2436	B1	2454	A2	3408	B6	3421	A4	3434	A5	3446	B4	3467	B3	3484	A6
2425	B5	2437	A1	2455	A1	3409	B6	3422	A4	3435	A5	3447	B4	3469	A5	3485	B4
2426	A6	2439	A3	2456	B1	3410	A6	3423	A4	3436	A5	3448	A7	3472	A5	3486	A6

3488	A3	3503	A6	3518	A5	3534	A1	3553	B2	4405	A6	4421	B1	4437	B2	4450	C5
3489	A5	3504	B5	3519	A3	3535	A1	3554	B1	4406	B7	4423	B1	4438	C4	7400	A3
3490	B5	3505	A3	3520	B2	3536	A1	3555	B5	4407	C4	4424	C4	4440	A6	7401	A5
3493	A3	3507	A2	3521	B5	3537	A1	3556	B5	4408	C3	4425	A2	4441	A6	7404	B7
3494	A6	3508	A2	3522	A3	3539	A3	3557	A6	4411	C6	4426	A2	4442	A6	7405	A7
3495	A6	3509	A1	3523	A3	3541	B1	3558	B1	4413	B5	4427	A2	4443	B4	7406	B6
3496	A6	3510	B5	3524	C4	3543	B1	3559	B1	4414	C5	4428	A1	4444	A3	7408	B5
3498	A2	3511	B5	3525	C4	3544	A3	4400	A1	4415	C6	4429	A3	4445	B5		
3499	B6	3512	B3	3526	A5	3545	B1	4401	A6	4417	C4	4430	B7	4446	A2		
3500	B5	3513	B4	3527	C4	3546	A3	4402	A6	4418	C3	4431	B4	4447	A2		
3501	B5	3515	B6	3529	A5	3547	A1	4403	A1	4419	C4	4435	B1	4448	A2		
3502	B5	3516	A3	3533	B1	3548	A1	4404	B6	4420	B2	4436	B1	4449	C5		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7400
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2415
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4443
3464
3477
3459
3419
3469
3472
3478

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

ELECTRICAL PARTS LIST - FRONT BOARD

4415	4822 051 20008	0R Jumper 0805
4417	4822 051 20008	0R Jumper 0805
4418	4822 051 20008	0R Jumper 0805
4419	4822 051 20008	0R Jumper 0805
4420	4822 051 20008	0R Jumper 0805
4421	4822 051 20008	0R Jumper 0805
4423	4822 051 20008	0R Jumper 0805
4424	4822 051 20008	0R Jumper 0805
4425	4822 051 20008	0R Jumper 0805
4426	4822 051 20008	0R Jumper 0805
4427	4822 051 20008	0R Jumper 0805
4428	4822 051 20008	0R Jumper 0805
4429	4822 051 20008	0R Jumper 0805
4430	4822 051 20008	0R Jumper 0805
4431	4822 051 20008	0R Jumper 0805
4435	4822 051 20008	0R Jumper 0805
4436	4822 051 20008	0R Jumper 0805
4437	4822 051 20008	0R Jumper 0805
4438	4822 051 20008	0R Jumper 0805
4440	4822 051 20008	0R Jumper 0805
4441	4822 051 20008	0R Jumper 0805
4442	4822 051 20008	0R Jumper 0805
4443	4822 051 20008	0R Jumper 0805
4444	4822 051 20008	0R Jumper 0805
4445	4822 051 20008	0R Jumper 0805
4446	4822 051 20008	0R Jumper 0805
4447	4822 051 20008	0R Jumper 0805
4448	4822 051 20008	0R Jumper 0805
4449	4822 051 20008	0R Jumper 0805
4450	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5400	4822 242 72066	Ceram Resonator 8MHz
5401	4822 242 70938	X'tal Resonator 32,768kHz
5402	4822 157 11477	Coil 2,2μH 5%

DIODES

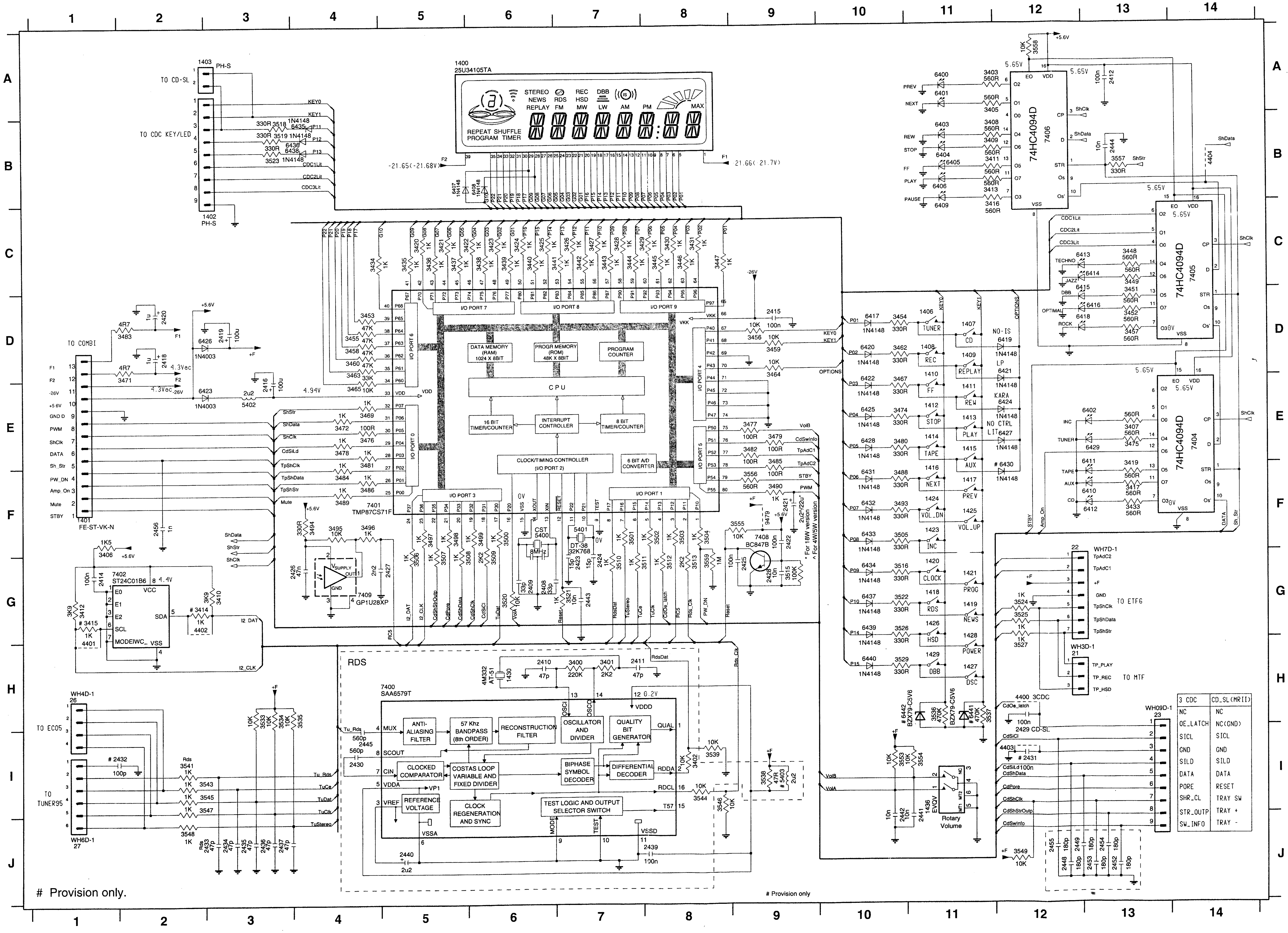
6400	4822 130 10791	LTL-1CHGE
6401	4822 130 10791	LTL-1CHGE
6402	4822 130 10791	LTL-1CHGE
6403	4822 130 10791	LTL-1CHGE
6404	4822 130 10791	LTL-1CHGE
6405	4822 130 10791	LTL-1CHGE
6406	4822 130 10791	LTL-1CHGE
6407	4822 130 30621	1N4148
6408	4822 130 30621	1N4148
6409	4822 130 10791	LTL-1CHGE
6410	4822 130 10792	LTL-1CHPE
6411	4822 130 10792	LTL-1CHPE
6412	4822 130 10792	LTL-1CHPE
6413	4822 130 10792	LTL-1CHPE
6414	4822 130 10792	LTL-1CHPE
6415	4822 130 10791	LTL-1CHGE
6416	4822 130 10792	LTL-1CHPE
6417	4822 130 30621	1N4148
6418	4822 130 10792	LTL-1CHPE
6419	4822 130 30621	1N4148
6420	4822 130 30621	1N4148
6421	4822 130 30621	1N4148
6422	4822 130 30621	1N4148
6423	4822 130 31878	1N4003G
6424	4822 130 30621	1N4148
6425	4822 130 30621	1N4148
6426	4822 130 31878	1N4003G
6428	4822 130 30621	1N4148
6429	4822 130 10792	LTL-1CHPE
6431	4822 130 30621	1N4148
6432	4822 130 30621	1N4148
6433	4822 130 30621	1N4148
6434	4822 130 30621	1N4148
6435	4822 130 30621	1N4148
6436	4822 130 30621	1N4148
6437	4822 130 30621	1N4148
6438	4822 130 30621	1N4148
6439	4822 130 30621	1N4148
6440	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7400	4822 209 31981	SAA6579T
7401	4822 209 16463	TMP87CP71F "326S51651"
7402	4822 209 31508	ST24C01B1
7404	4822 209 15449	74HC4094D
7405	4822 209 15449	74HC4094D
7406	4822 209 15449	74HC4094D
7408	4822 130 60511	BC847B
7409	4822 130 10165	GP1U28XP

Note : Only the parts mentioned in this list are normal service parts.

CIRCUIT DIAGRAM


1 2 3 4 5 6 7 8 9 10 11 12 13 14
A B C D E F G H I J
1403 PH-S
TO CD-SL
TO CDC KEY/LED
1402 PH-S
1400 25U34105TA
STEREO NEWS REPLAY RDS FM REC HSD MW DBB LW AM PM MAX
REPEAT SHUFFLE PROGRAM TIMER
-21.65(-21.68V)
21.66(21.7V)
TO COMBI
1401 FE-ST-VK-N
F1 F2 -26V +5.6V GND D PWM ShClk DATA Sh_Str PW_DN Amp_On Mute STBY
7401 TMP87CS71F
I/O PORT 7
I/O PORT 8
I/O PORT 9
I/O PORT 6
I/O PORT 4
I/O PORT 0
I/O PORT 5
I/O PORT 3
I/O PORT 1
DATA MEMORY (RAM) 1024 X 8BIT
PROGR MEMORY (ROM) 48K X 8BIT
PROGRAM COUNTER
CPU
16 BIT TIMER/COUNTER
INTERRUPT CONTROLLER
8 BIT TIMER/COUNTER
CLOCK/TIMING CONTROLLER (I/O PORT 2)
6 BIT A/D CONVERTER
7402 ST24C01B6
7409 GP1U28XP
5400 CST 8MHz
5401 DT-38 32K768
7408 BC847B
* For 18W version
* For 4W/5W version
7406 74HC4094D
7405 74HC4094D
7404 74HC4094D
PREV NEXT REW STOP FF PLAY PAUSE
TECHNO JAZZ DBB OPTIMAL ROCK
INC TUNER TAPE AUX CD
TUNER CD REC REPLAY FF REW STOP PLAY TAPE AUX NEXT PREV VOL_DN VOL_UP INC PROG CLOCK RDS NEWS HSD POWER DBB DSC
NO-IS LP KARA NO CTRL LIT
WH7D-1 TO ETF6
WH3D-1 TO MTF
WH09D-1
3 CDC | CD_SL(MRII)
NC | NC
OE_LATCH | NC(GND)
SICL | SICL
GND | GND
SILD | SILD
DATA | DATA
PORE | RESET
SHR_CL | TRAY SW
STR_OUTP | TRAY +
SW_INFO | TRAY -
Rotary Volume
RDS
7400 SAA6579T
ANTI-ALIASING FILTER
57 Khz BANDPASS (8th ORDER)
RECONSTRUCTION FILTER
OSCILLATOR AND DIVIDER
QUALITY BIT GENERATOR
CLOCKED COMPARATOR
COSTAS LOOP VARIABLE AND FIXED DIVIDER
BIPHASE SYMBOL DECODER
DIFFERENTIAL DECODER
REFERENCE VOLTAGE
CLOCK REGENERATION AND SYNC
TEST LOGIC AND OUTPUT SELECTOR SWITCH
WH4D-1 TO ECO5
TO TUNER95
WH6D-1
# Provision only
# Provision only.

D.C. VOLTAGES DURING ACTIVE PLAY
VALUES IN BRACKET ARE D.C. VOLTAGES AT STANDBY.

21	H12
22	G12
23	H13
26	H1
27	J1
1400	A5
1401	F1
1402	C2
1403	A2
1406	D11
1407	D11
1408	D11
1409	D11
1410	E11
1411	E11
1412	E11
1413	E11
1414	E11
1415	E11
1416	F11
1417	F11
1418	G11
1419	G11
1420	G11
1421	G11
1423	F11
1424	F11
1425	F11
1426	G11
1427	H11
1428	H11
1429	H11
1430	H6
1436	J11
2408	G6
2409	G6
2410	H6
2411	H7
2412	A13
2414	G1
2415	D9
2416	E3
2418	D2
2419	D3
2420	D2
2421	F9
2422	F9
2423	G7
2424	G7
2425	G9
2426	G3
2427	G5
2428	G9
2429	I12
2430	I4
2431	I12
2432	I1
2433	J2
2434	J3
2435	J3
2436	J3
2437	J3
2439	J8
2440	J5
2441	J11
2442	J10
2443	G7
2444	B13
2445	I4
2448	J12
2449	J12
2452	J13
2453	J13
2454	J13
2455	J12
2456	F2
3400	H7
3401	H7
3402	I8
3403	A11
3405	A11
3406	F1
3407	E13
3408	B11
3409	B11
3410	G3
3411	B11
3412	G1
3413	B11
3414	G2
3415	G1
3416	C11
3417	F13
3419	E13
3420	C5
3421	C5
3422	C6
3423	C6
3424	C6
3425	C6
3426	C7
3427	C7
3428	C7
3429	C8
3430	C8
3431	C8
3433	F13
3434	C4
3435	C5
3436	C5
3437	C5
3438	C6
3439	C6
3440	C6
3441	C7
3442	C7
3443	C7
3444	C7
3445	C8
3446	C8
3447	C8
3448	C13
3449	C13
3451	D13
3452	D13
3453	D4
3454	D10
3455	D4
3456	D9
3457	D13
3458	D4
3459	D9
3460	D4
3462	D10
3463	D4
3464	D9
3465	E4
3467	E10
3469	E4
3471	D2
3472	E4
3474	E10
3475	E13
3476	E4
3477	E9
3478	E4
3479	E9
3480	E10
3481	E4
3482	E9
3483	D2
3484	F4
3485	E9
3486	F4
3488	F10
3489	F4
3490	F9
3493	F10
3494	F4
3495	F4
3496	F4
3497	F5
3498	F5
3499	F6
3500	F6
3501	F7
3502	F8
3503	F8
3504	F8
3505	F10
3506	G5
3507	G5
3508	G5
3509	G6
3510	G7
3511	G7
3512	G8
3513	G8
3515	G9
3516	G10
3518	B3
3519	B3
3520	G6
3521	G7
3522	G10
3523	B3
3524	G12
3525	G12
3526	G10
3527	H12
3529	H10
3533	H3
3534	H3
3535	H4
3536	H11
3537	H11
3538	I9
3539	I8
3541	I2
3543	I2
3544	I8
3545	I2
3546	I8
3547	I2
3548	J2
3549	J12
3553	I10
3554	I11
3555	F9
3556	F9
3557	B13
3558	A12
3559	G8
4400	H12
4401	H1
4402	G2
4403	I12
4404	B14
5400	F6
5401	F7
5402	E3
5403	I9
6400	A11
6401	A11
6402	E13
6403	B11
6404	B11
6405	B11
6406	B11
6407	B5
6408	B6
6409	C11
6410	F13
6411	F13
6412	F13
6413	C13
6414	C13
6415	D13
6416	D13
6417	D10
6418	D13
6419	D12
6420	D10
6421	D12
6422	E10
6423	E2
6424	E12
6425	E10
6426	D2
6427	E12
6428	E10
6429	E13
6430	F12
6431	F10
6432	F10
6433	F10
6434	G10
6435	B4
6436	B4
6437	G10
6438	B4
6439	G10
6440	H10
6441	H11
6442	H10
7400	H4
7401	F4
7402	G1
7404	E14
7405	C14
7406	B12
7408	F9
7409	G4
9479	F9

ELECTRICAL PARTS LIST - FRONT BOARD

MISCELLANEOUS

1400	4822 135 00171	FTD Display
1401	4822 267 10756	Flex Connector 13 pin
1406	4822 276 13114	Tact Switch
1407	4822 276 13114	Tact Switch
1408	4822 276 13114	Tact Switch
1410	4822 276 13114	Tact Switch
1411	4822 276 13114	Tact Switch
1412	4822 276 13114	Tact Switch
1413	4822 276 13114	Tact Switch
1414	4822 276 13114	Tact Switch
1415	4822 276 13114	Tact Switch
1416	4822 276 13114	Tact Switch
1417	4822 276 13114	Tact Switch
1418	4822 276 13114	Tact Switch
1420	4822 276 13114	Tact Switch
1421	4822 276 13114	Tact Switch
1423	4822 276 13114	Tact Switch
1426	4822 276 13114	Tact Switch
1427	4822 276 13114	Tact Switch
1428	4822 276 13114	Tact Switch
1429	4822 276 13114	Tact Switch
1430	4822 242 72195	Quartz 4,332 MHz
1436	4822 101 21261	Rotary Encoder 24P

CAPACITORS

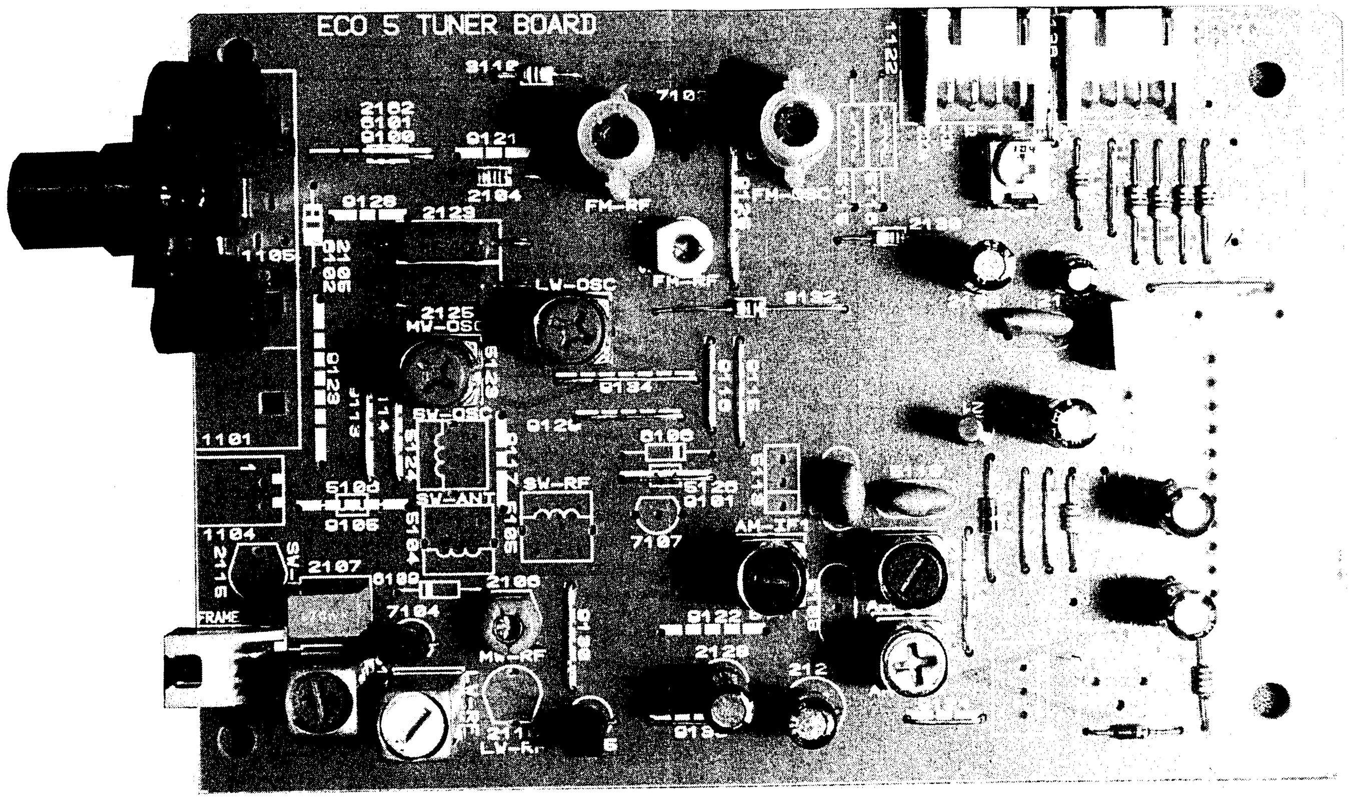
2408	5322 122 32659	33pF 5% 50V
2409	5322 122 32659	33pF 5% 50V
2410	4822 126 13692	47pF 1% 63V
2411	4822 126 13692	47pF 1% 63V
2412	4822 126 10002	100nF 20% 25V
2414	4822 126 10002	100nF 20% 25V
2415	4822 126 10002	100nF 20% 25V
2416	4822 124 42446	100µF 20% 10V
2418	4822 124 22651	1,0µF 20% 50V
2419	4822 124 42446	100µF 20% 10V
2420	4822 124 22651	1,0µF 20% 50V
2421	4822 124 41796	22µF 20% 16V
2422	4822 126 10002	100nF 20% 25V
2423	4822 126 13486	15pF 2% 63V
2424	4822 126 13486	15pF 2% 63V
2425	4822 126 10002	100nF 20% 25V
2426	4822 126 13751	47nF 10% 63V
2427	4822 122 33175	2,2nF 20% 50V
2428	4822 122 33177	10nF 20% 50V
2429	4822 126 10002	100nF 20% 25V
2430	4822 122 33173	560pF 10% 50V
2432	5322 122 32531	100pF 5% 50V
2433	4822 126 13692	47pF 1% 63V
2434	4822 126 13692	47pF 1% 63V
2435	4822 126 13692	47pF 1% 63V
2436	4822 126 13692	47pF 1% 63V
2437	4822 126 13692	47pF 1% 63V
2439	4822 126 10002	100nF 20% 25V
2440	4822 124 22652	2,2µF 20% 50V
2441	4822 122 33177	10nF 20% 50V
2442	4822 122 33177	10nF 20% 50V
2443	4822 122 33177	10nF 20% 50V
2444	4822 122 33177	10nF 20% 50V
2445	4822 122 33173	560pF 10% 50V
2456	5322 122 34123	1nF 10% 50V

RESISTORS

3400	4822 051 20224	220k 5% 0,1W
3401	4822 117 11449	2k2 1% 0,1W
3402	4822 117 10833	10k 1% 0,1W
3403	4822 117 11503	220R 1% 0.1W
3405	4822 117 11503	220R 1% 0.1W
3406	4822 117 11139	1k5 1% 0,1W
3407	4822 051 20561	560R 5% 0,1W
3408	4822 117 11503	220R 1% 0.1W
3409	4822 117 11503	220R 1% 0.1W
3410	4822 051 20392	3k9 5% 0,1W
3411	4822 117 11503	220R 1% 0.1W
3412	4822 051 20392	3k9 5% 0,1W
3413	4822 117 11503	220R 1% 0.1W
3416	4822 117 11503	220R 1% 0.1W
3417	4822 051 20561	560R 5% 0,1W
3419	4822 051 20561	560R 5% 0,1W
3420	4822 051 10102	1k 2% 0,25W
3421	4822 051 10102	1k 2% 0,25W
3422	4822 051 10102	1k 2% 0,25W
3423	4822 051 10102	1k 2% 0,25W
3424	4822 051 10102	1k 2% 0,25W
3425	4822 051 10102	1k 2% 0,25W
3426	4822 051 10102	1k 2% 0,25W
3427	4822 051 10102	1k 2% 0,25W
3428	4822 051 10102	1k 2% 0,25W
3429	4822 051 10102	1k 2% 0,25W
3430	4822 051 10102	1k 2% 0,25W
3431	4822 051 10102	1k 2% 0,25W
3433	4822 051 20561	560R 5% 0,1W
3434	4822 051 10102	1k 2% 0,25W
3435	4822 051 10102	1k 2% 0,25W
3436	4822 051 10102	1k 2% 0,25W
3437	4822 051 10102	1k 2% 0,25W
3438	4822 051 10102	1k 2% 0,25W
3439	4822 051 10102	1k 2% 0,25W
3440	4822 051 10102	1k 2% 0,25W
3441	4822 051 10102	1k 2% 0,25W
3442	4822 051 10102	1k 2% 0,25W
3443	4822 051 10102	1k 2% 0,25W
3444	4822 051 10102	1k 2% 0,25W
3445	4822 051 10102	1k 2% 0,25W
3446	4822 051 10102	1k 2% 0,25W

ELECTRICAL PARTS LIST - FRONT BOARD

3447	4822 051 10102	1k 2% 0,25W
3448	4822 051 20561	560R 5% 0,1W
3449	4822 051 20561	560R 5% 0,1W
3451	4822 051 20561	560R 5% 0,1W
3452	4822 051 20561	560R 5% 0,1W
3453	4822 116 83884	47k 5% 0,5W
3454	4822 051 20331	330R 5% 0,1W
3455	4822 116 83884	47k 5% 0,5W
3456	4822 117 10833	10k 1% 0,1W
3457	4822 051 20561	560R 5% 0,1W
3458	4822 116 83884	47k 5% 0,5W
3459	4822 117 10833	10k 1% 0,1W
3460	4822 116 83884	47k 5% 0,5W
3462	4822 051 20331	330R 5% 0,1W
3463	4822 116 52271	33k 5% 0,5W
3464	4822 117 10833	10k 1% 0,1W
3465	4822 116 83864	10k 5% 0,5W
3467	4822 051 20331	330R 5% 0,1W
3469	4822 051 10102	1k 2% 0,25W
3471	4822 050 24708	4R7 1% 0,6W
3472	4822 051 10102	1k 2% 0,25W
3474	4822 051 20331	330R 5% 0,1W
3475	4822 051 20561	560R 5% 0,1W
3476	4822 051 20101	100R 5% 0,1W
3477	4822 051 20101	100R 5% 0,1W
3478	4822 051 10102	1k 2% 0,25W
3479	4822 051 20101	100R 5% 0,1W
3480	4822 051 20331	330R 5% 0,1W
3481	4822 051 10102	1k 2% 0,25W
3482	4822 051 20101	100R 5% 0,1W
3483	4822 050 24708	4R7 1% 0,6W
3484	4822 051 10102	1k 2% 0,25W
3485	4822 051 20101	100R 5% 0,1W
3486	4822 051 10102	1k 2% 0,25W
3488	4822 051 20331	330R 5% 0,1W
3489	4822 051 10102	1k 2% 0,25W
3490	4822 051 10102	1k 2% 0,25W
3493	4822 051 20331	330R 5% 0,1W
3494	4822 051 20331	330R 5% 0,1W
3495	4822 117 10833	10k 1% 0,1W
3496	4822 051 10102	1k 2% 0,25W
3497	4822 050 11002	1k 1% 0,4W
3498	4822 051 10102	1k 2% 0,25W
3499	4822 051 10102	1k 2% 0,25W
3500	4822 051 10102	1k 2% 0,25W
3501	4822 051 10102	1k 2% 0,25W
3502	4822 051 10102	1k 2% 0,25W
3503	4822 051 10102	1k 2% 0,25W
3504	4822 051 10102	1k 2% 0,25W
3505	4822 051 20331	330R 5% 0,1W
3506	4822 050 11002	1k 1% 0,4W
3507	4822 051 10102	1k 2% 0,25W
3508	4822 051 10102	1k 2% 0,25W
3509	4822 117 11449	2k2 1% 0,1W
3510	4822 051 10102	1k 2% 0,25W
3511	4822 051 10102	1k 2% 0,25W
3512	4822 051 10102	1k 2% 0,25W
3513	4822 117 11449	2k2 1% 0,1W
3515	4822 051 20104	100k 5% 0,1W
3516	4822 051 20331	330R 5% 0,1W
3518	4822 051 20331	330R 5% 0,1W
3519	4822 051 20331	330R 5% 0,1W
3520	4822 117 10833	10k 1% 0,1W
3521	4822 051 10102	1k 2% 0,25W
3522	4822 051 20331	330R 5% 0,1W
3523	4822 051 20331	330R 5% 0,1W
3524	4822 051 10102	1k 2% 0,25W
3525	4822 051 10102	1k 2% 0,25W
3526	4822 051 20331	330R 5% 0,1W
3527	4822 051 10102	1k 2% 0,25W
3529	4822 051 20331	330R 5% 0,1W
3533	4822 117 10833	10k 1% 0,1W
3534	4822 117 10833	10k 1% 0,1W
3535	4822 117 10833	10k 1% 0,1W
3536	4822 051 20474	470k 5% 0,1W
3537	4822 051 20474	470k 5% 0,1W
3538	4822 116 52195	47R 5% 0,5W
3539	4822 117 10833	10k 1% 0,1W
3541	4822 051 10102	1k 2% 0,25W
3543	4822 051 10102	1k 2% 0,25W
3544	4822 117 10833	10k 1% 0,1W
3545	4822 051 10102	1k 2% 0,25W
3546	4822 117 10833	10k 1% 0,1W
3547	4822 051 10102	1k 2% 0,25W
3548	4822 051 10102	1k 2% 0,25W
3549	4822 116 83864	10k 5% 0,5W
3553	4822 117 10833	10k 1% 0,1W
3554	4822 117 10833	10k 1% 0,1W
3555	4822 117 10833	10k 1% 0,1W
3556	4822 051 20561	560R 5% 0,1W
3557	4822 051 20331	330R 5% 0,1W
3558	4822 117 10833	10k 1% 0,1W
3559	4822 051 20105	1M 5% 0,1W
4401	4822 051 20008	0R Jumper 0805
4402	4822 051 20008	0R Jumper 0805
4403	4822 051 20008	0R Jumper 0805
4405	4822 051 20008	0R Jumper 0805
4406	4822 051 20008	0R Jumper 0805
4407	4822 051 20008	0R Jumper 0805
4408	4822 051 20008	0R Jumper 0805
4411	4822 051 20008	0R Jumper 0805
4413	4822 051 20008	0R Jumper 0805
4414	4822 051 20008	0R Jumper 0805


ECO 5 TUNER BOARD
FM-RF
FM-OSC
LW-OSC
MW-OSC
SW-OSC
SW-ANT
SW-RF
MW-RF
LW-RF
AM-IF1
FRAME

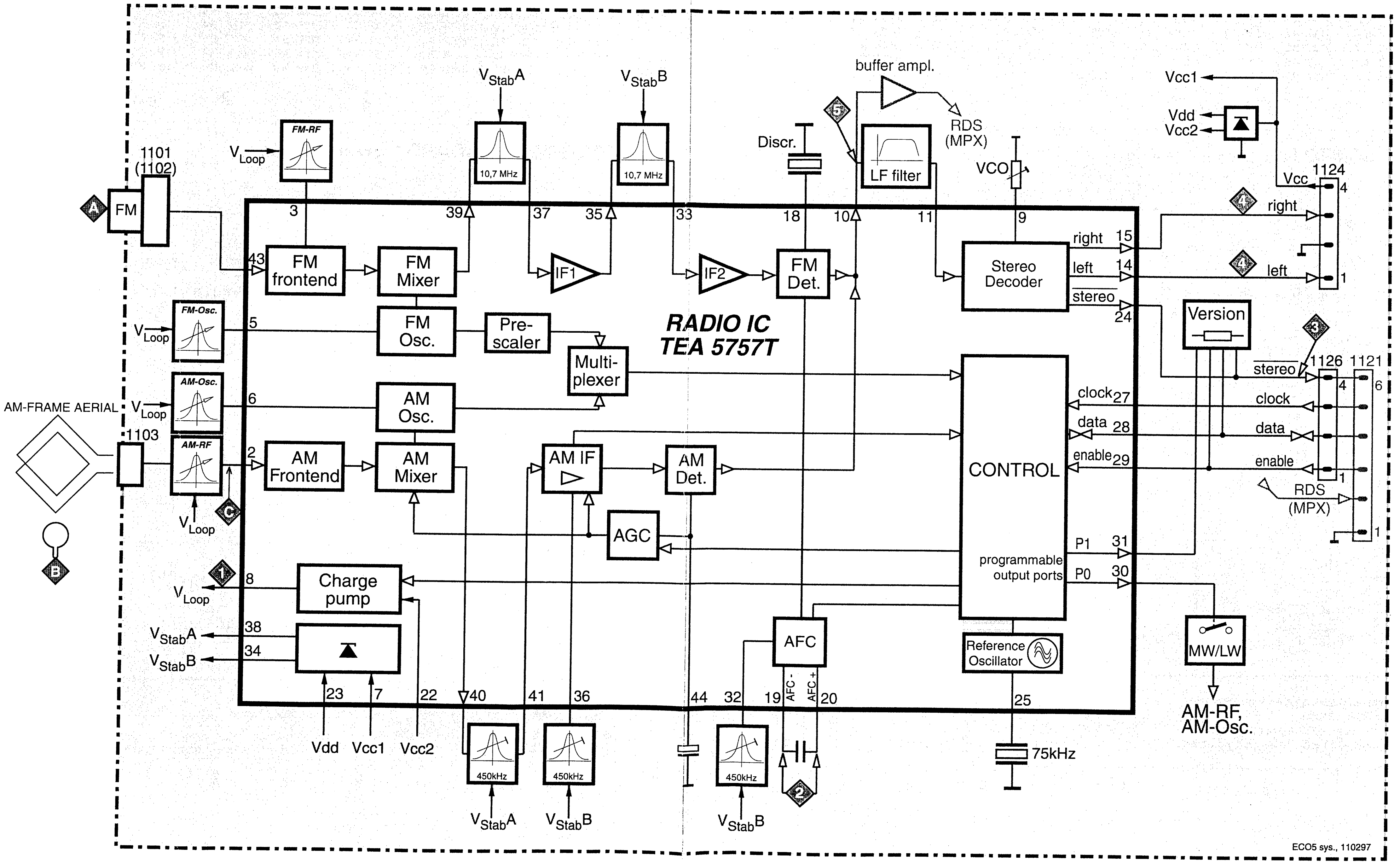
TUNER BOARD ECO5

TABLE OF CONTENTS

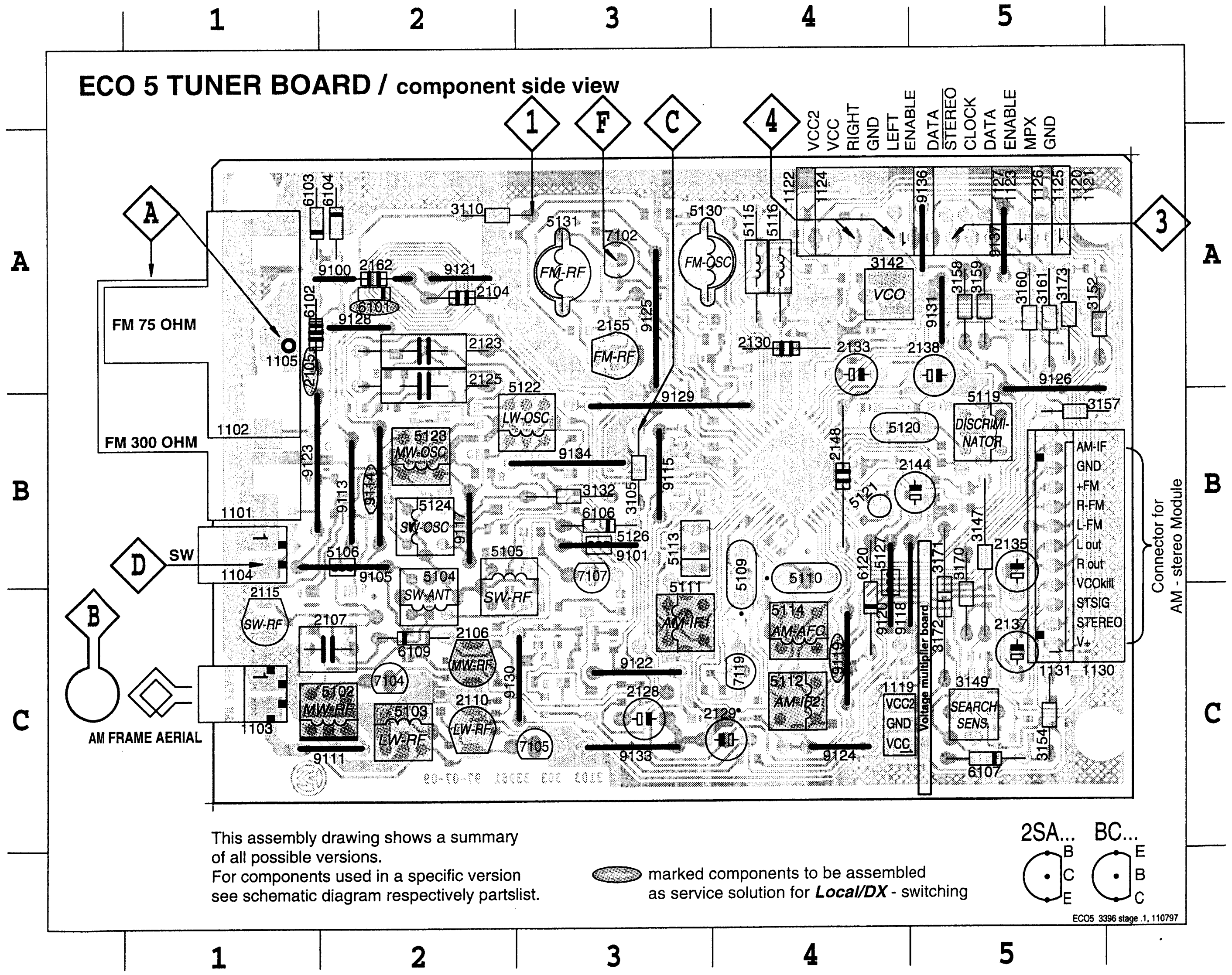
Blockdiagram 7B-1
Adjustmant table 7B-2
Component layout..7B-2
Circuit diagram 7B-3
Partslist 7B-4

BLOCKDIAGRAM

TUNER BOARD
ECO 5 systems


RADIO IC
TEA 5757T
FM
1101
(1102)
A
FM-RF
V_{Loop}
$V_{Stab}A$
$V_{Stab}B$
10,7 MHz
10,7 MHz
buffer ampl.
RDS
(MPX)
5
Discr.
LF filter
VCO
Vcc1
Vdd
Vcc2
1124
Vcc
4
right
left
1
FM frontend
FM Mixer
FM Osc.
Pre-scaler
Multi-plexer
IF1
IF2
FM Det.
Stereo Decoder
right
left
stereo
Version
3
stereo
1126
1121
clock
data
enable
RDS
(MPX)
FM-Osc.
AM-Osc.
AM-RF
AM-FRAME AERIAL
1103
B
C
AM Osc.
AM Frontend
AM Mixer
AM IF
AM Det.
AGC
CONTROL
clock
data
enable
P1
P0
programmable output ports
1
Charge pump
$V_{Stab}A$
$V_{Stab}B$
AFC
AFC -
AFC +
Reference Oscillator
MW/LW
AM-RF,
AM-Osc.
Vdd
Vcc1
Vcc2
450kHz
450kHz
450kHz
75kHz
2
3 39 37 35 33 18 10 11 9 15 14 24 27 28 29 31 30 43 5 6 2 8 38 34 23 7 22 40 41 36 44 32 19 20 25
ECO5 sys., 110297

1101 A1	2106 C2	2137 C5	3149 C5	3173 A5	5114 C4	5130 A3	7104 C2	9117 B2	9129 B3		
1102 A1	2107 C2	2138 A5	3152 A5	5102 C2	5115 A4	5131 A3	7105 C3	9118 B4	9130 C3		
1103 C1	2110 C2	2144 B5	3154 C5	5103 C2	5116 A4	6101 A2	7107 B3	9119 C4	9131 A5		
1104 B1	2115 C1	2148 B4	3157 B5	5104 C2	5119 B5	6102 A1	7119 C4	9120 B4	9133 C3		
1105 A1	2123 A2	2155 A3	3158 A5	5105 B2	5120 B4	6103 A1	9100 A2	9121 A2	9134 B3		
1119 C5	2125 A2	2162 A2	3159 A5	5106 B2	5121 B4	6104 A2	9101 B3	9122 C3	9136 A5		
1120 A5	2128 C3	3105 B3	3160 A5	5109 B4	5122 B3	6106 B3	9105 B2	9123 B1	9137 A5		
1130 B5	2129 C4	3110 A2	3161 A5	5110 B4	5123 B2	6107 C5	9111 C2	9124 C4			
1131 B5	2130 A4	3132 B3	3170 C5	5111 C3	5124 B2	6109 C2	9113 B2	9125 A3			
2104 A2	2133 A4	3142 A4	3171 C5	5112 C4	5126 B3	6120 C4	9114 B2	9126 B5			
2105 A1	2135 B5	3147 B5	3172 C5	5113 B3	5127 B4	7102 A3	9115 B3	9128 A2			

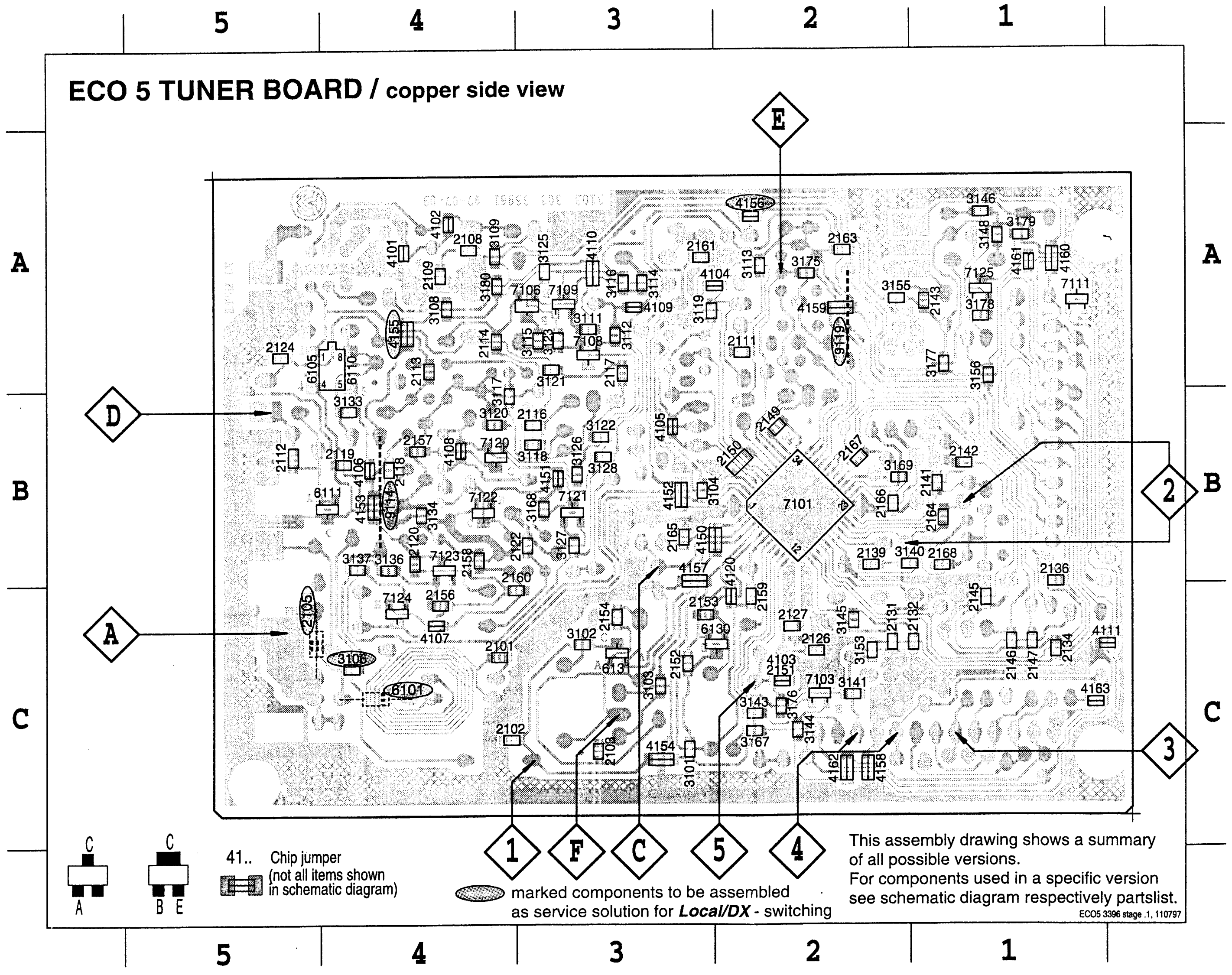

1
2
3
4
5
A
B
C
1
F
C
4
3
A
D
B
VCC2
VCC
RIGHT
GND
LEFT
ENABLE
DATA
STEREO
CLOCK
DATA
ENABLE
MPX
GND
FM 75 OHM
FM 300 OHM
SW
AM FRAME AERIAL
FM-RF
FM-OSC
VCO
LW-OSC
MW-OSC
SW-OSC
SW-ANT
SW-RF
MW-RF
LW-RF
AM-IF1
AM-AFC
AM-IF2
DISCRIMI-NATOR
SEARCH SENS.
Voltage multiplier board
VCC2
GND
VCC
AM-IF
GND
+FM
R-FM
L-FM
L out
R out
VCOkill
STSIG
STEREO
V+
Connector for AM - stereo Module
2SA...
BC...
B
C
E
E
B
C
ECO5 3396 stage 1, 110797

ECO 5 TUNER BOARD / component side view

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

marked components to be assembled as service solution for ***Local/DX*** - switching

2101 C4	2118 B4	2139 B2	2153 C3	2166 B2	3112 A3	3123 A3	3143 C2	3175 A2	4106 B4	4154 C3	6110 A4	7121 B3
2102 C4	2119 B4	2141 B1	2154 C3	2167 B2	3113 A2	3125 A3	3144 C2	3176 C2	4107 C4	4155 A4	6111 B4	7122 B4
2103 C3	2120 B4	2142 B1	2156 C4	2168 B1	3114 A3	3126 B3	3145 C2	3177 A1	4108 B4	4156 A2	6130 C2	7123 B4
2108 A4	2122 B3	2143 A1	2157 B4	3101 C3	3115 A3	3127 B3	3146 A1	3178 A1	4109 A3	4157 B3	6131 C3	7124 C4
2109 A4	2124 A5	2145 C1	2158 B4	3102 C3	3116 A3	3128 B3	3148 A1	3179 A1	4110 A3	4158 C2	7101 B2	7125 A1
2111 A2	2126 C2	2146 C1	2159 C2	3103 C3	3117 B4	3133 B4	3153 C2	3180 A4	4111 C1	4159 A2	7103 C2	
2112 B5	2127 C2	2147 C1	2160 C4	3104 B3	3118 B3	3134 B4	3155 A2	4101 A4	4120 C2	4160 A1	7106 A3	
2113 A4	2131 C2	2149 B2	2161 A3	3106 C4	3119 A3	3136 B4	3156 A1	4102 A4	4150 B2	4161 A1	7108 A3	
2114 A4	2132 C1	2150 B2	2163 A2	3108 A4	3120 B4	3137 B4	3167 C2	4103 C2	4151 B3	4162 C1	7109 A3	
2116 B3	2134 C1	2151 C2	2164 B1	3109 A4	3121 A3	3140 B2	3168 B3	4104 A2	4152 B3	4163 C1	7111 A1	
2117 A3	2136 B1	2152 C3	2165 B3	3111 A3	3122 B3	3141 C2	3169 B2	4105 B3	4153 B4	6105 A4	7120 B4	


5
4
3
2
1
A
B
C
E
D
A
2
3
1
F
C
5
4
7101
C
A
C
B E
41..
ECO5 3396 stage 1, 110797

ECO 5 TUNER BOARD / copper side view

Chip jumper (not all items shown in schematic diagram)

marked components to be assembled as service solution for ***Local/DX*** - switching

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

TUNER AD

Waveran
VARICAP AL
FM 87.5 - 108M (65.81 - 74, 87.5 - 1
MW FM/AM-version, 10kH 530 - 1700k
FM/MW-version, 9kH 531 - 1602k
LW 153 - 279kH:
MW FM/MW/LW- version, 531 - 1602kH
FM IF
FM
FM RF
FM 87.5 - 108M (65.81 - 74, 87.5 - 1
VCO
FM
AM IF
MW
AM AFC **MW**
AM RF [3]
MW [4] FM/MW/LW- and FM/M\ (9kHz grid) 531 - 1602kH
LW
MW FM/AM-version, 10kH 530 - 1700kH

Use service test prc

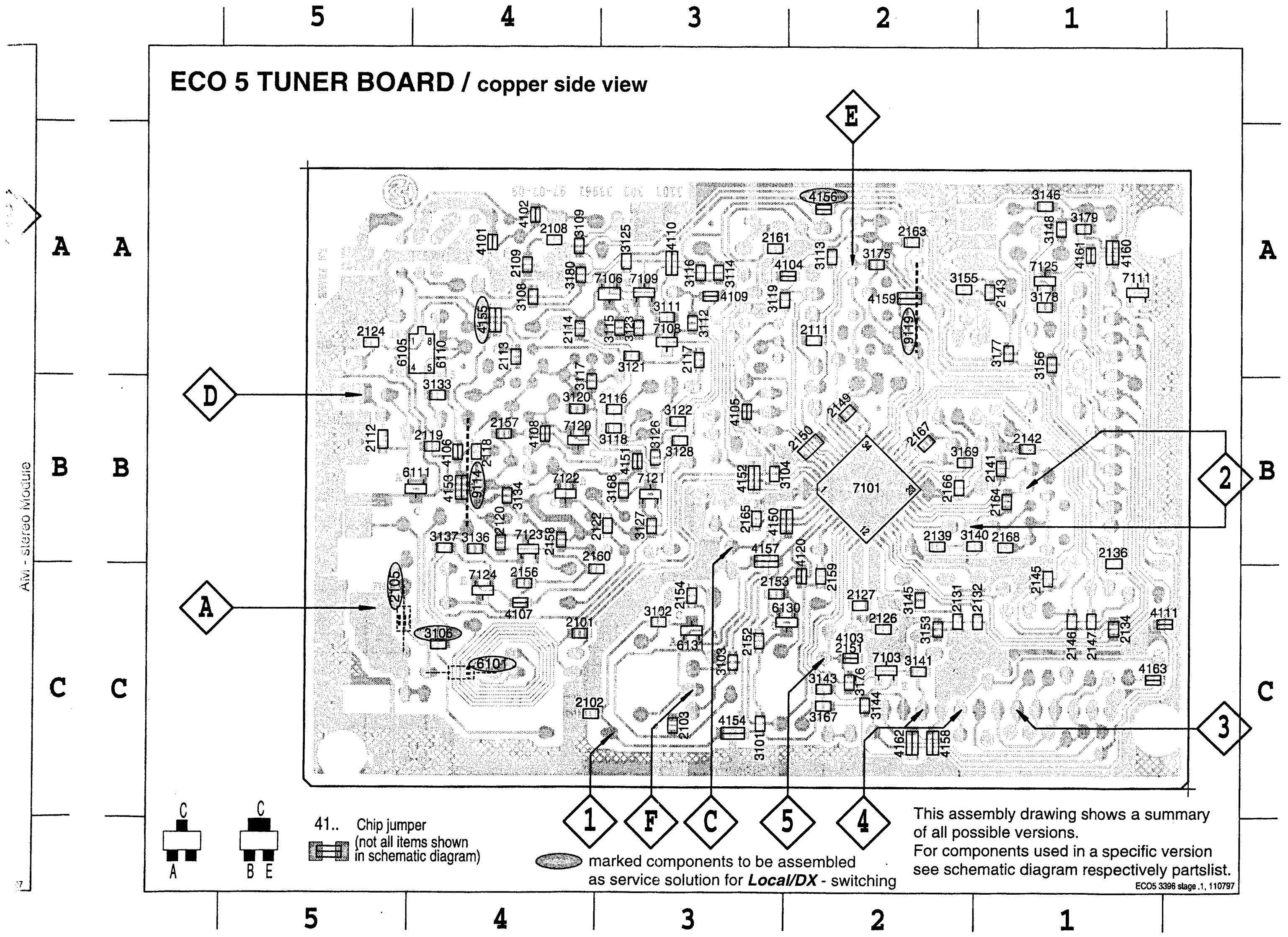
[1] If sensitivity of fre
(input signal: ster

[3] For AM RF adjus

↕ Repeat

2101 C4	2118 B4	2139 B2	2153 C3	2166 B2	3112 A3	3123 A3	3143 C2	3175 A2	4106 B4	4154 C3	6110 A4	7121 B3
2102 C4	2119 B4	2141 B1	2154 C3	2167 B2	3113 A2	3125 A3	3144 C2	3176 C2	4107 C4	4155 A4	6111 B4	7122 B4
2103 C3	2120 B4	2142 B1	2156 C4	2168 B1	3114 A3	3126 B3	3145 C2	3177 A1	4108 B4	4156 A2	6130 C2	7123 B4
2108 A4	2122 B3	2143 A1	2157 B4	3101 C3	3115 A3	3127 B3	3146 A1	3178 A1	4109 A3	4157 B3	6131 C3	7124 C4
2109 A4	2124 A5	2145 C1	2158 B4	3102 C3	3116 A3	3128 B3	3148 A1	3179 A1	4110 A3	4158 C2	7101 B2	7125 A1
2111 A2	2126 C2	2146 C1	2159 C2	3103 C3	3117 B4	3133 B4	3153 C2	3180 A4	4111 C1	4159 A2	7103 C2	
2112 B5	2127 C2	2147 C1	2160 C4	3104 B3	3118 B3	3134 B4	3155 A2	4101 A4	4120 C2	4160 A1	7106 A3	
2113 A4	2131 C2	2149 B2	2161 A3	3106 C4	3119 A3	3136 B4	3156 A1	4102 A4	4150 B2	4161 A1	7108 A3	
2114 A4	2132 C1	2150 B2	2163 A2	3108 A4	3120 B4	3137 B4	3167 C2	4103 C2	4151 B3	4162 C1	7109 A3	
2116 B3	2134 C1	2151 C2	2164 B1	3109 A4	3121 A3	3140 B2	3168 B3	4104 A2	4152 B3	4163 C1	7111 A1	
2117 A3	2136 B1	2152 C3	2165 B3	3111 A3	3122 B3	3141 C2	3169 B2	4105 B3	4153 B4	6105 A4	7120 B4	

ECO 5 TUNER BOARD / copper side view



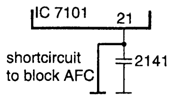
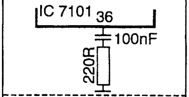
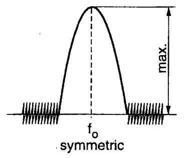
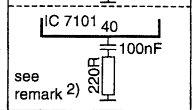
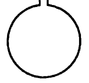
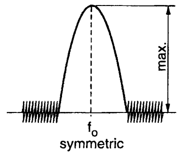
Chip jumper (not all items shown in schematic diagram)

marked components to be assembled as service solution for ***Local/DX*** - switching

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

ECO5 3396 stage .1, 110797

TUNER ADJUSTMENT TABLE (**ECO5** FM/MW- and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 50mV continuous wave	F	 IC 7101 21 shortcircuit to block AFC 2141	5119	2	0 ± 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	A mod=1kHz Δf=±22.5kHz	108MHz	2155	4	MAX
	87.5MHz (65.81MHz)		87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz [1]
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with short wire to ground (pin 4)	C Δf=±15kHz V_{RF} = 3mV	 IC 7101 36 100nF 220R	5111	4	 max. f_o symmetric
			 IC 7101 40 100nF 220R see remark [2]	5112		
AM AFC **MW**		C continuous wave V_{RF} = 10mV		5114	2	0 ± 2 mV DC
AM RF [3]						
MW [4] FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	B  Δf = ±30kHz V_{RF} as low as possible	1494kHz	2106	4	 max. f_o symmetric
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz		1500kHz	2106		
	560kHz		560kHz	5102		

ECO5, discr. coil, 090797

Use service test program. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

[1] If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

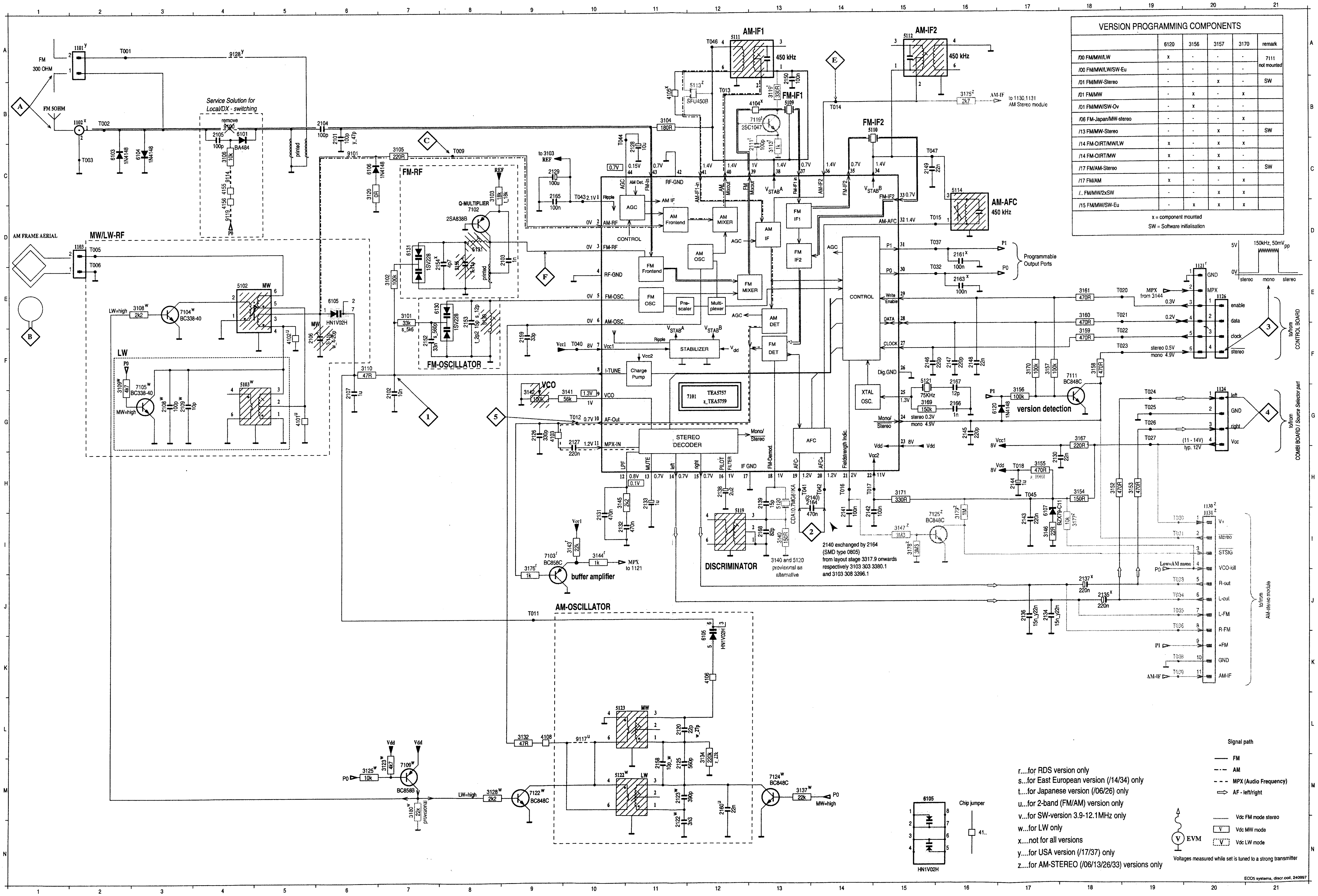
[2] RC network serves for damping the IF-filter while adjusting the other one.

[3] For AM RF adjustments the original frame antenna has to be used !

[4] MW has to be aligned before LW.

↕ Repeat

TUNER BOARD ECO5 / Systems


AM-IF1
AM-IF2
FM-IF1
FM-IF2
AM-AFC
450 kHz
FM-RF
FM-OSCILLATOR
MW/LW-RF
MW
LW
AM FRAME AERIAL
FM 300 OHM
FM 50HM
Service Solution for Local/DX - switching
Q-MULTIPLIER
VCO
buffer amplifier
AM-OSCILLATOR
DISCRIMINATOR
version detection
AGC
AM Frontend
AM MIXER
AM IF
AM OSC
FM Frontend
FM OSC
Pre-scaler
Multi-plexer
FM MIXER
FM IF1
FM IF2
AM DET
FM DET
STABILIZER
Charge Pump
CONTROL
XTAL OSC.
AFC
STEREO DECODER
TEA5757
TEA5759
Programmable Output Ports
to/from CONTROL BOARD
to/from COMBI BOARD / Source Selector part
to/from AM-stereo module
to 1130.1131 AM Stereo module
150kHz, 50mVpp
stereo
mono
stereo
2140 exchanged by 2164 (SMD type 0805) from layout stage 3317.9 onwards respectively 3103 303 3380.1 and 3103 308 3396.1
3140 and 5120 provisional as alternative
Chip jumper
HN1V02H
ECO5 systems, discr.coil, 240997

VERSION PROGRAMMING COMPONENTS

	6120	3156	3157	3170	remark
/00 FM/MW/LW	x	-	-	-	7111 not mounted
/00 FM/MW/LW/SW-Eu	-	-	-	-	
/01 FM/MW-Stereo	-	-	x	-	SW
/01 FM/MW	-	x	-	x	
/01 FM/MW/SW-Ov	-	x	-	-	
/06 FM-Japan/MW-stereo	-	-	-	x	
/13 FM/MW-Stereo	-	-	x	-	SW
/14 FM-OIRT/MW/LW	x	-	x	x	
/14 FM-OIRT/MW	x	-	x	-	
/17 FM/AM-Stereo	-	-	x	-	SW
/17 FM/AM	x	-	-	x	
/.. FM/MW/2xSW	-	-	x	x	
/15 FM/MW/SW-Eu	-	x	x	x	

x = component mounted
SW = Software initialisation

r....for RDS version only
s...for East European version (/14/34) only
t....for Japanese version (/06/26) only
u...for 2-band (FM/AM) version only
v...for SW-version 3.9-12.1MHz only
w...for LW only
x....not for all versions
y....for USA version (/17/37) only
z....for AM-STEREO (/06/13/26/33) versions only

Signal path

—	FM
-·-	AM
- - -	MPX (Audio Frequency)
⇨	AF - left/right

EVM

....	Vdc FM mode stereo
V	Vdc MW mode
V	Vdc LW mode

Voltages measured while set is tuned to a strong transmitter

1101	A 1
1102	B 2
1103	D 2
1121	E20
1124	G20
1126	E20
1130	I20
1131	I20
2101	C 6
2102	G 7
2103	D 9
2104	B 6
2106	F 5
2107	G 6
2108	G 3
2109	G 3
2111	C13
2120	L11
2122	N11
2123	M11
2125	M11
2126	G 9
2127	G10
2128	C11
2129	C 9
2130	H17
2131	I10
2132	I10
2133	H11
2134	J17
2135	J18
2136	J17
2137	J18
2138	H12
2139	H13
2140	H14
2141	H14
2142	H14
2143	I17
2144	H17
2145	G16
2146	F15
2147	F16
2148	F16
2149	C15
2150	B13
2152	F 7
2153	E 8
2154	E 7
2155	D 8
2158	M11
2159	F 9
2160	M12
2161	D16
2163	E16
2164	H14
2165	C 9
2166	G16
2167	F16
2168	I 13
3101	E 7
3102	E 7
3103	C 8
3104	B11
3105	C 7
3108	E 3
3109	F 2
3110	F 6
3113	C13
3119	B13
3120	C 6
3123	M 7
3125	M 6
3128	M 8
3132	L 9
3134	M12
3137	M13
3140	I13
3141	G10
3142	G 9
3143	I10
3144	I10
3145	H10
3146	I17
3147	I15
3152	H18
3153	H19
3154	H18
3155	H17
3156	G17
3157	F17
3158	F18
3159	F18
3160	E18
3161	E18
3167	G18
3169	G15
3170	F17
3171	H15
3175	B16
3176	J 9
3177	I18
3178	I15
3179	I16
3180	M7
4101	G 5
4102	F 5
4103	G 9
4104	B13
4105	B11
4106	K12
4108	L 9
5102	E 4
5103	F 4
5109	B13
5110	B14
5111	A13
5112	A15
5113	B12
5114	C16
5119	I 12
5120	H13
5121	F15
5122	M11
5123	L11
5130	E 8
5131	D 8
6103	C 2
6104	C 3
6105	K12
6105	E 6
6106	C 6
6107	H17
6120	G16
6130	E 7
6131	D 7
7101	G11
7102	D 8
7103	I 9
7104	E 3
7105	F 2
7109	M 7
7111	F18
7119	B13
7122	M 9
7124	M13
7125	I16
9100	B 4
9101	C 6
9117	L10
9128	A 4

ELECTRICAL PARTS LIST - ECO5 TUNER BOARD

MISCELLANEOUS

1101	4822 267 31505	Antenna Socket 300R	
1102	4822 267 10283	Antenna Socket Coax IEC 75R	

CAPACITORS

2101	5322 122 32531	100pF 5% 50V	
2101	4822 126 13692	47pF 1% 63V	for USA
2102	4822 122 33177	10nF 20% 50V	
2103	5322 122 34123	1nF 10% 50V	
2104	4822 122 33195	100pF 10% 50V	
2106	4822 125 50355	Trimmer 4-20pF	for LW version
2106	4822 125 60101	Trimmer 3-11pF 100V	
2107	4822 121 51319	1µF 10% 63V	
2108	5322 122 32531	100pF 5% 50V	for LW version
2109	5322 122 32448	10pF 5% 50V	for LW version
2120	4822 126 13691	27pF 1% 63V	for LW version
2120	5322 122 32658	22pF 5% 50V	
2122	4822 122 33891	3,3nF 10% 63V	for LW version
2125	4822 121 51381	560pF 5% 400V	
2126	5322 122 31863	330pF 5% 50V	
2127	4822 126 13473	220nF +80/-20% 50V	
2128	4822 124 41579	10µF 20% 50V	
2129	4822 124 41584	100µF 20% 10V	
2130	4822 126 11585	22nF+80/- 20% 25V	
2131	4822 122 33325	470nF 16V	
2132	4822 122 33325	470nF 16V	
2131	4822 126 13482	470nF +80/- 20% 16V	
2132	4822 126 13482	470nF +80/- 20% 16V	
2133	4822 124 40242	1µF 20% 63V	
2134	4822 126 13188	15nF 5% 63V	
2134	5322 122 32654	22nF 10% 63V	for USA
2135	4822 124 40746	0,22µF 20% 63V	
2136	4822 126 13188	15nF 5% 63V	
2136	5322 122 32654	22nF 10% 63V	for USA
2137	4822 124 40746	0,22µF 20% 63V	
2138	4822 124 41576	2,2µF 20% 50V	
2139	4822 126 14236	50V 15pF 5%	
2140	4822 121 51252	470nF 5% 63V	
2141	4822 126 10002	100nF 20% 25V	
2142	4822 126 10002	100nF 20% 25V	
2143	4822 126 13473	220nF +80/-20% 50V	
2144	4822 124 40242	1µF 20% 63V	
2145	4822 122 33575	220pF 5% 50V	
2146	4822 122 33575	220pF 5% 50V	
2147	4822 122 33575	220pF 5% 50V	
2148	4822 126 11585	22nF+80/- 20% 25V	
2149	5322 122 32654	22nF 10% 63V	
2150	4822 122 31947	100nF 20% 63V	
2152	5322 116 80853	560pF 5% 63V	for East. Europe
2152	4822 126 12105	33nF 5% 63V	
2153	4822 122 32139	12pF 2% 63V	for East. Europe
2153	4822 122 32504	15pF 2% 63V	
2155	4822 125 60101	Trimmer 3-11pF 100V	
2158	5322 122 32448	10pF 5% 50V	for LW version
2159	5322 122 32659	33pF 5% 50V	
2160	5322 122 32654	22nF 10% 63V	
2161	4822 126 10002	100nF 20% 25V	
2163	4822 126 10002	100nF 20% 25V	
2164	4822 126 13482	470nF +80/- 20% 16V	
2165	4822 126 10002	100nF 20% 25V	
2166	5322 122 34123	1nF 10% 50V	
2167	4822 122 32139	12pF 2% 63V	
2168	4822 126 13695	82pF 1% 63V	

RESISTORS

3101	4822 051 20562	5k6 5% 0,1W	for East. Europe
3101	4822 051 20333	33k 5% 0,1W	
3102	4822 051 20104	100k 5% 0,1W	
3103	4822 117 10965	18k 1% 0,1W	
3104	4822 117 11448	180R 1% 0,1W	
3105	4822 116 83872	220R 5% 0,5W	
3108	4822 117 11449	2k2 1% 0,1W	for LW version
3109	4822 051 20472	4k7 5% 0,1W	for LW version
3110	4822 116 52195	47R 5% 0,5W	
3120	4822 051 20008	0R Jumper 0805	
3123	4822 051 20472	4k7 5% 0,1W	for LW version
3125	4822 117 10833	10k 1% 0,1W	for LW version
3128	4822 117 11449	2k2 1% 0,1W	for LW version
3132	4822 116 52195	47R 5% 0,5W	
3134	4822 051 20224	220k 5% 0,1W	
3137	4822 051 20223	22k 5% 0,1W	for LW version
3140	4822 051 20008	0R Jumper 0805	
		5120=CDA10.7MG40K	
3140	4822 117 10353	150R 1% 0,1W	
		5120=CDA10.7MG61KA	
3141	4822 051 20563	56k 5% 0,1W	
3142	4822 100 11163	Trimmer 100k 30% 0,1W	
3143	4822 051 20223	22k 5% 0,1W	for RDS version
3144	4822 051 10102	1k 2% 0,25W	for RDS version
3145	4822 117 11449	2k2 1% 0,1W	
3146	4822 051 20229	22R 5% 0,1W	
3152	4822 116 83883	470R 5% 0,5W	
3153	4822 051 20471	470R 5% 0,1W	
3154	4822 116 83868	150R 5% 0,5W	
3155	4822 051 20471	470R 5% 0,1W	
3156	4822 051 20104	100k 5% 0,1W	for /21/30/33 only
3157	4822 116 52234	100k 5% 0,5W	for East. Europe
3158	4822 116 83883	470R 5% 0,5W	
3159	4822 116 83883	470R 5% 0,5W	
3160	4822 116 83883	470R 5% 0,5W	
3161	4822 116 83883	470R 5% 0,5W	
3167	4822 117 11503	220R 1% 0.1W	
3169	4822 051 20154	150k 5% 0,1W	
3170	4822 116 52234	100k 5% 0,5W	
3171	4822 116 52219	330R 5% 0,5W	

ELECTRICAL PARTS LIST - ECO5 TUNER BOARD

3176	4822 051 10102	1k 2% 0,25W	for RDS version
4101	4822 051 20008	0R Jumper 0805	for 2-Band only
4102	4822 051 20008	0R Jumper 0805	for 2-Band only
4103	4822 051 20008	0R Jumper 0805	
4104	4822 051 20008	0R Jumper 0805	
4105	4822 051 20008	0R Jumper 0805	
4106	4822 051 20008	0R Jumper 0805	
4108	4822 051 20008	0R Jumper 0805	
4111	4822 051 20008	0R Jumper 0805	
4120	4822 051 20008	0R Jumper 0805	
4150	4822 051 10008	0R Jumper 1206	
4151	4822 051 20008	0R Jumper 0805	
4152	4822 051 10008	0R Jumper 1206	
4153	4822 051 10008	0R Jumper 1206	
4154	4822 051 10008	0R Jumper 1206	
4155	4822 051 10008	0R Jumper 1206	
4156	4822 051 20008	0R Jumper 0805	
4157	4822 051 10008	0R Jumper 1206	
4158	4822 051 10008	0R Jumper 1206	
4159	4822 051 10008	0R Jumper 1206	
4162	4822 051 10008	0R Jumper 1206	

COILS & FILTERS

5102	4822 157 71634	MW RF Coil	
5103	4822 157 71635	LW RF Coil	for LW version
5109	4822 242 70665	Ceram Filter 10,7MHz	
5110	4822 242 70665	Ceram Filter 10,7MHz	
5111	4822 158 60511	AM-IF Filter 450kHz	
5112	4822 157 70302	AM-IF Filter 450kHz	
5114	4822 157 70302	AM-IF Filter 450kHz	
5119	4822 157 11443	Discriminator 10,7MHz	
5120	4822 242 82065	Cer. Disc. 10,7MG40K	
5120	4822 242 10251	Cer. Disc.10,7MG61KA-TF21	
5121	4822 242 10261	Quartz 75kHz	
5122	4822 157 60517	Osc. Coil LW	for LW version
5123	4822 157 60517	Osc. Coil MW	
5130	4822 156 30947	RF-Coil 1.5T	
5131	4822 156 30947	RF-Coil 1.5T	

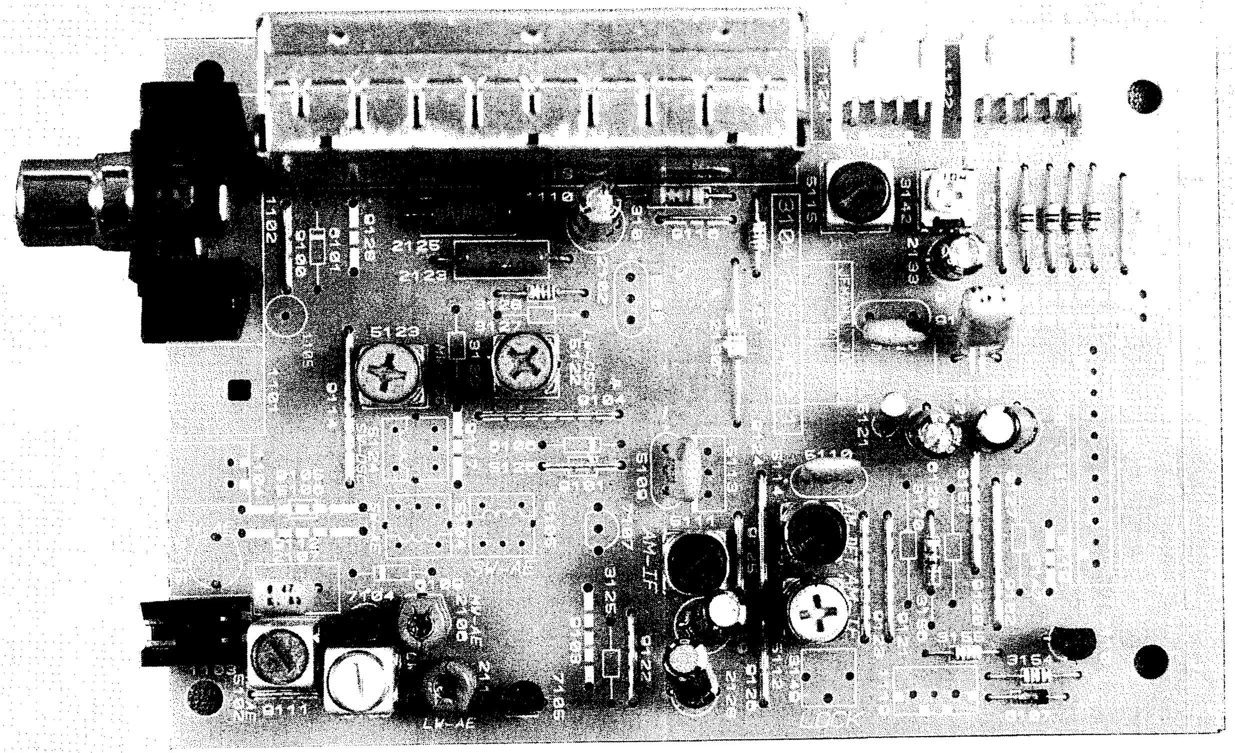
DIODES

6103	4822 130 30621	1N4148	
6104	4822 130 30621	1N4148	
6105	4822 130 83075	HN1V02H-B	
6106	4822 130 30621	1N4148	
6107	4822 130 34488	BZX79-B11	
6120	4822 130 30621	1N4148	not for /21/30/33
6130	4822 130 82833	1SV228	
6131	4822 130 82833	1SV228	

TRANSISTORS & INTEGRATED CIRCUITS

7101	4822 209 90924	TEA5757H/V1	
7102	4822 130 60093	2SA838B	
7103	4822 130 42513	BC858C	for RDS version
7104	5322 130 44779	BC338-40	for LW version
7105	5322 130 44779	BC338-40	for LW version
7109	5322 130 41983	BC858B	for LW version
7111	5322 130 42136	BC848C	
7122	5322 130 42136	BC848C	for LW version
7124	5322 130 42136	BC848C	for LW version

Note: Only the parts mentioned in this list are normal service spare parts.

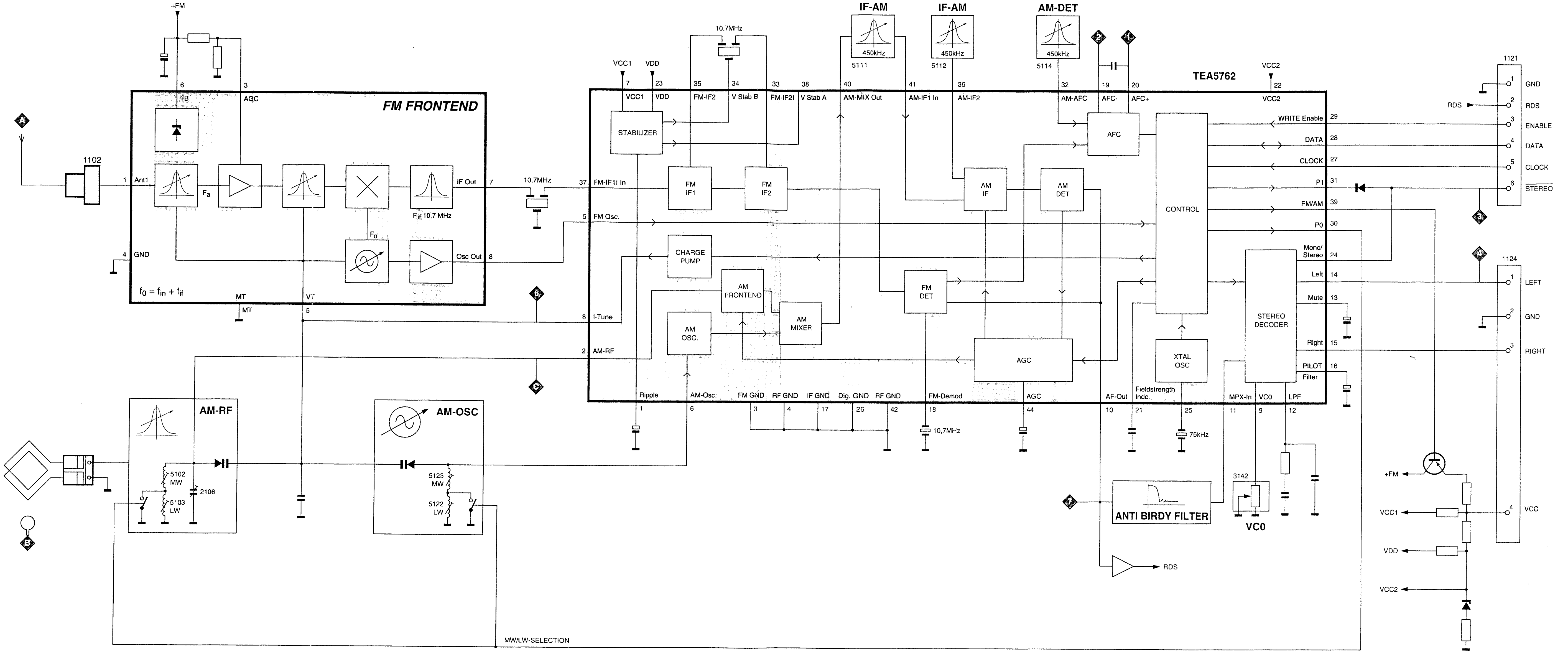


TUNER 95 BOARD

TABLE OF CONTENTS

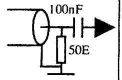
Blockdiagram 7D-1
Adjustmant table 7D-2
Component layout..7D-2
Circuit diagram...7D-3
Partslist 7D-4

BLOCKDIAGRAM



FM FRONTEND
+FM
+B
AGC
Ant1
GND
IF Out
Osc Out
Fa
Fo
Fif 10,7 MHz
f0 = fin + fif
MT
VT
1102
10,7MHz
TEA5762
VCC1
VDD
VCC2
FM-IF2
V Stab B
FM-IF2I
V Stab A
AM-MIX Out
AM-IF1 In
AM-IF2
AM-AFC
AFC-
AFC+
FM-IF1I In
FM Osc.
I-Tune
AM-RF
STABILIZER
FM IF1
FM IF2
CHARGE PUMP
AM FRONTEND
AM MIXER
AM OSC.
AM IF
AM DET
FM DET
AGC
AFC
CONTROL
XTAL OSC
STEREO DECODER
IF-AM
IF-AM
AM-DET
450kHz
5111
5112
5114
WRITE Enable
DATA
CLOCK
P1
FM/AM
P0
Mono/ Stereo
Left
Mute
Right
PILOT Filter
Ripple
AM-Osc.
FM GND
RF GND
IF GND
Dig. GND
RF GND
FM-Demod
AGC
AF-Out
Fieldstrength Indc.
MPX-In
VCO
LPF
75kHz
AM-RF
AM-OSC
5102 MW
5103 LW
2106
5123 MW
5122 LW
ANTI BIRDY FILTER
3142
VC0
RDS
MW/LW-SELECTION
1121
GND
RDS
ENABLE
DATA
CLOCK
STEREO
1124
LEFT
GND
RIGHT
VCC
+FM
VCC1
VDD
VCC2

TUNER 95 bis Adjustment Table (FM, MW, LW with Frame antenna)

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT						
FM (50)			108 MHz	check	6	7 ... 9V
87.5 - 108 MHz			87.5 MHz	check		1.3 ... 2V
MW (9)			1602 kHz	5123		8.3V ± 0.2V
531 - 1602 kHz			531 kHz	check		1V ± 0.4V
LW (3)			279 kHz	5122		8.3V ± 0.2V
153 - 279 kHz			153 kHz	check		1V ± 0.4V
FM – DETECTION						
FM	98 MHz 1mV continuous wave ***short pin 21 (IC7101) to ground***	A	98 MHz	5107	1 2	0mV ± 3mV
FM – VCO						
FM	98 MHz 1 mV continuous wave	A	98 MHz	3142	3	152kHz ± 1 kHz
DISTORTION						
FM	98 MHz 1 mV 90 % L + 9 % pilot mod = 1kHz	A	98MHz	mixcoil inside Tuner 1110	4	Distortion minimum
AM – IF						
MW	450kHz Δf = 10kHz Low as possible Swept signal		MW	5111	7	symmetrical and max. height ↕
				5112		
	450kHz continuous wave	C		5114	1 2	0mV ± 2mV
AM - RF						
MW	558kHz Mod = 1kHz 30 % AM 1494 kHz	B	558kHz	5102	7	MAX ↕
			1494kHz	2106		
LW	198kHz mod = 1kHz 30 % AM	*	198kHz	5103		MAX

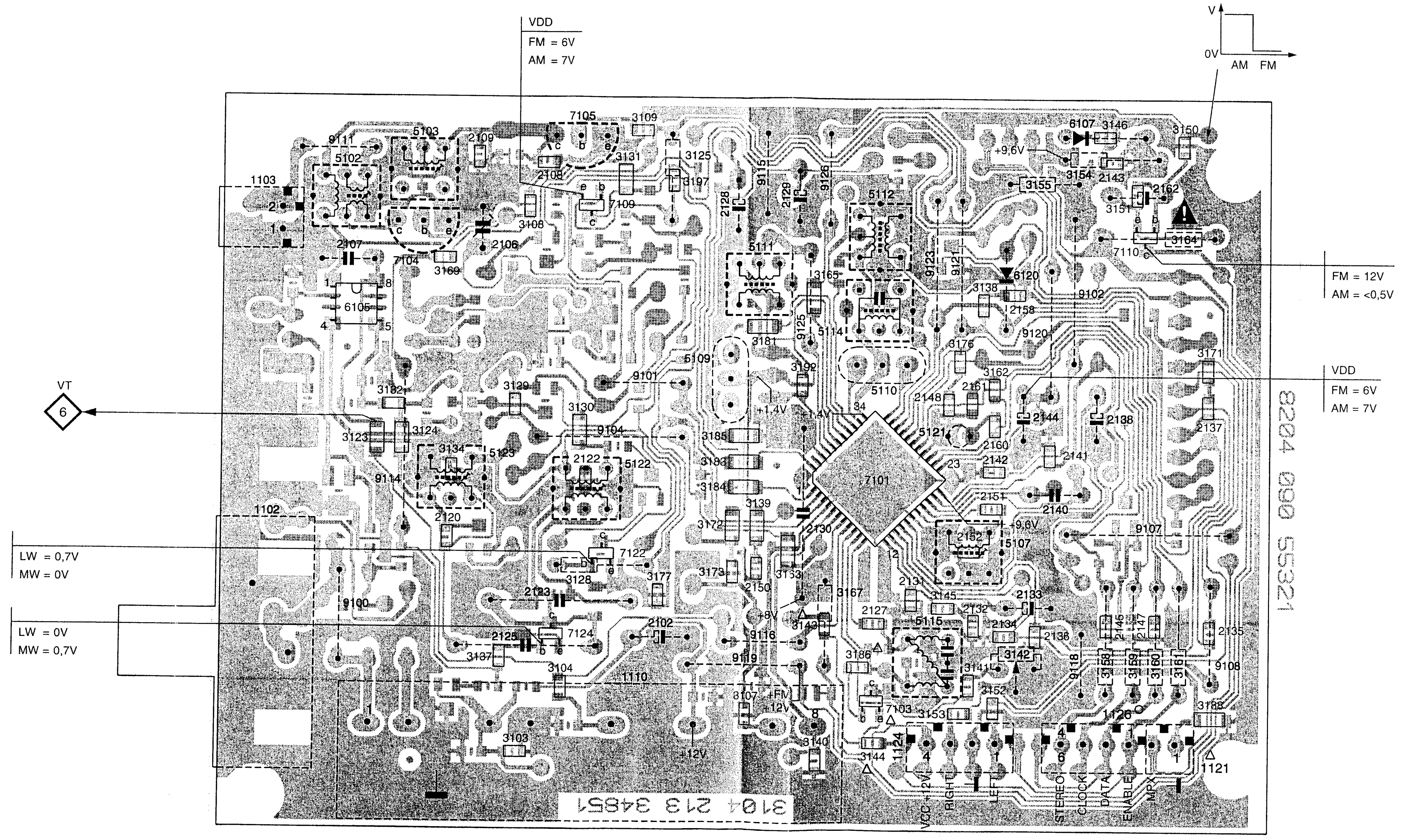
adjtable for 3104 217 04121/04341

* Signal send via a frame antenna
(..) = tuning grid in kHz

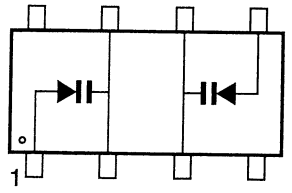
↕ repeat

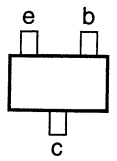
1102	F4	2107	C4	2128	C7	2136	G10	2145	G11	2161	E9	3124	E5	3137	G5	3145	F9	3158	G11	3167	F8	3183	E7	5103	C5	5121	E9	7104	D5	9102	D10	9118	G10
1103	C3	2108	C6	2129	C8	2137	E11	2147	G11	2162	C11	3125	C7	3138	D9	3146	B10	3159	G11	3169	D5	3184	E7	5107	F10	5122	E7	7105	B6	9104	E6	9119	G7
1110	G7	2109	C5	2130	F8	2138	E10	2148	E9	3103	H6	3128	F6	3139	F8	3150	C11	3160	G11	3171	D11	3185	E7	5109	D7	5123	E5	7109	C6	9107	F11	9120	D10
1121	H11	2120	F5	2131	F9	2140	F10	2150	F8	3104	G6	3129	E6	3140	H8	3151	C10	3161	G11	3172	F7	3186	G8	5110	E9	6105	D4	7110	D11	9108	G11	9121	D9
1124	H9	2122	E6	2132	F9	2141	E10	2151	F9	3107	G7	3130	E6	3141	G9	3152	G9	3162	D9	3173	F7	3188	G11	5111	C8	6107	B10	7122	F7	9111	C4	9123	D9
1126	G10	2123	F6	2133	F10	2142	E9	2152	F9	3108	C6	3131	C6	3142	G10	3153	G9	3163	F8	3176	D9	3192	D8	5112	C9	6120	D10	7124	G6	9114	E5	9125	D8
2102	G7	2125	G5	2134	G10	2143	C10	2158	D10	3109	B7	3132	E5	3143	G8	3154	C10	3164	C11	3177	F7	3197	C7	5114	D8	7101	E9	9100	F4	9115	C8	9126	C8
2106	C5	2127	F9	2135	G11	2144	E10	2160	E9	3123	E4	3134	E5	3144	H8	3155	C10	3165	D8	3181	D8	5102	C4	5115	G9	7103	G9	9101	E7	9116	G8		

TUNER 95 bis Combi: Copper side view


VDD
FM = 6V
AM = 7V
V
0V
AM FM
FM = 12V
AM = <0,5V
VDD
FM = 6V
AM = 7V
VT
6
LW = 0,7V
MW = 0V
LW = 0V
MW = 0,7V
8204 090 55321
3104 213 34851
VCC-12V
RIGHT
LEFT
STEREO
CLOCK
DATA
ENABLE
MPX
1121

IC 6105



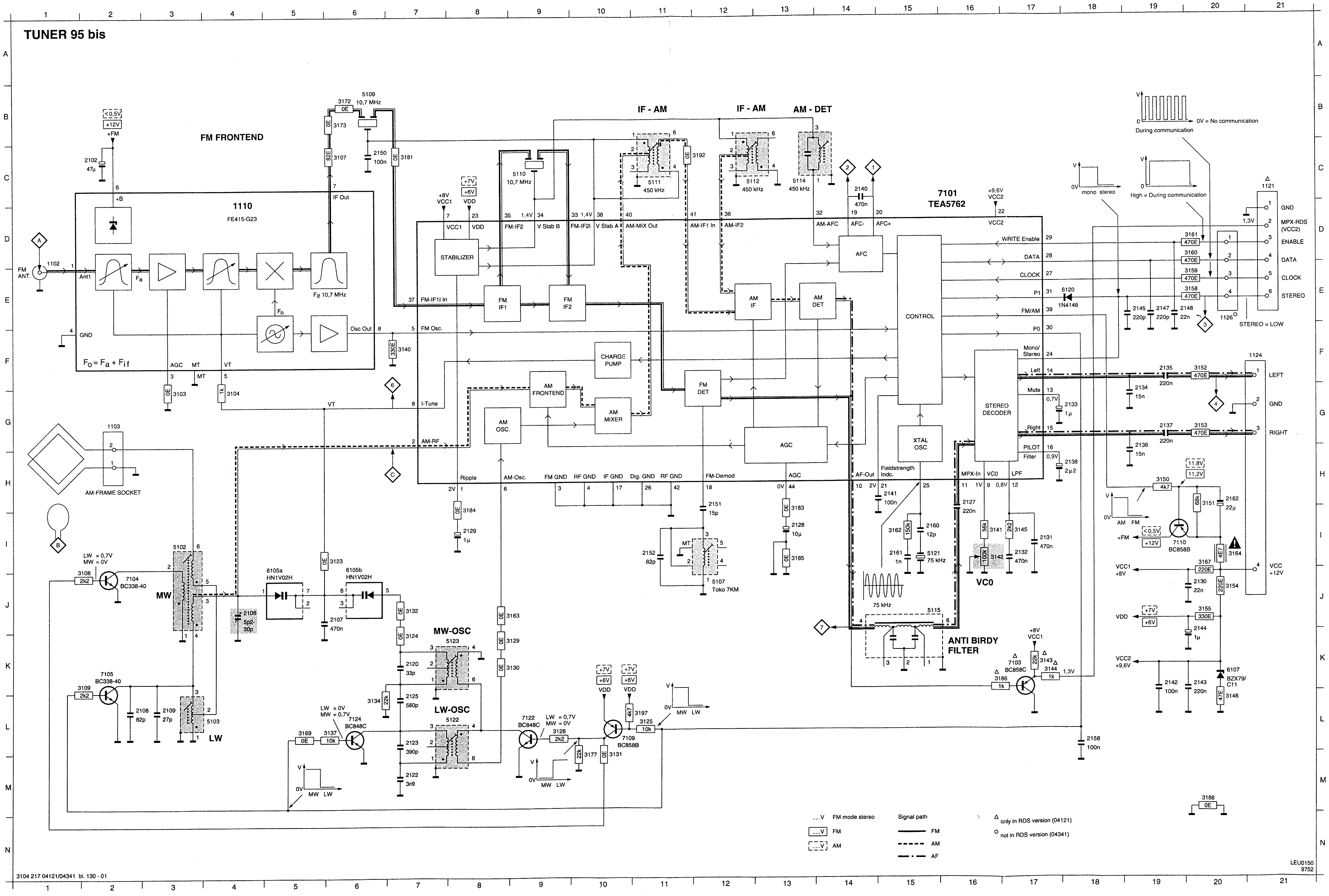


△ only in RDS version (04121)

○ not in RDS version (04341)

1102	D1
1103	G2
1110	D4
1121	C21
1124	F21
1126	E20
2102	C2
2106	J4
2107	J6
2108	L2
2109	L3
2120	K7
2122	M7
2123	L7
2125	L7
2127	H16
2128	I13
2129	I8
2130	J20
2131	I17
2132	I17
2133	G18
2134	G19
2135	F19
2136	H19
2137	G19
2138	H18
2140	C14
2141	H15
2142	K19
2143	K20
2144	K20
2145	E19
2147	E19
2148	E19
2150	C6
2151	H12
2152	I11
2158	L18
2160	I15
2161	I15
2162	H20
3103	G3
3104	G4
3107	C6
3108	J1
3109	K1
3123	I6
3124	K7
3125	L11
3128	L9
3129	K8
3130	K8
3131	M10
3132	J7
3134	L6
3137	L5
3140	F7
3141	I16
3142	I16
3143	K17
3144	K17
3145	I17
3146	L20
3150	H19
3151	I20
3152	F20
3153	G20
3154	J20
3155	J20
3158	E19
3159	E19
3160	D19
3161	D19
3162	I15
3163	J8
3164	I20
3167	I20
3169	L5
3172	B6
3173	B6
3177	M10
3181	C7
3183	I13
3184	I8
3185	I13
3186	K16
3188	M20
3192	C12
3197	L11
5102	I3
5103	L4
5107	J12
5109	B6
5110	C9
5111	C11
5112	C12
5114	C13
5115	J15
5121	I15
5122	L7
5123	K7
6105a	I5
6105b	I6
6107	K20
6120	E17
7101	C15
7103	K17
7104	J2
7105	K2
7109	L10
7110	I19
7122	L9
7124	L6

TUNER 95 bis



FM FRONTEND
1110
FE415-G23
FM ANT.
Ant1
Fa
Fif 10,7 MHz
Fo
Fo = Fa + Fif
IF Out
Osc Out
GND
AGC
MT
VT
+B
<0,5V
+12V
+FM
5109 10,7 MHz
3172 0E
3173 0E
3107 82E
2150 100n
3181 0E
2102 47µ
3103 0E
3104 1k
3140 330E
5110 10,7 MHz
IF - AM
IF - AM
AM - DET
5111 450 kHz
5112 450 kHz
5114 450 kHz
3192 0E
2140 470n
7101
TEA5762
+8V VCC1
+7V +6V VDD
+9,6V VCC2
VCC1
VDD
FM-IF2
V Stab B
FM-IF2I
V Stab A
AM-MIX Out
AM-IF1 In
AM-IF2
AM-AFC
AFC-
AFC+
VCC2
STABILIZER
FM-IF1I In
FM IF1
FM IF2
FM Osc.
I-Tune
AM-RF
CHARGE PUMP
AM FRONTEND
AM MIXER
AM OSC.
FM DET
AM IF
AM DET
AFC
AGC
CONTROL
STEREO DECODER
XTAL OSC
WRITE Enable
DATA
CLOCK
P1
FM/AM
P0
Mono/Stereo
Left
Mute
Right
PILOT Filter
Ripple
AM-Osc.
FM GND
RF GND
IF GND
Dig. GND
RF GND
FM-Demod
AGC
AF-Out
Fieldstrength Indc.
MPX-In
VCO
LPF
6120 1N4148
3161 470E
3160 470E
3159 470E
3158 470E
2145 220p
2147 220p
2148 22n
1126
1121
GND
MPX-RDS (VCC2)
ENABLE
DATA
CLOCK
STEREO
STEREO = LOW
0V = No communication
During communication
High = During communication
mono stereo
1124
LEFT
GND
RIGHT
VCC +12V
2135 220n
3152 470E
2134 15n
2133 1µ
2137 220n
3153 470E
2136 15n
2138 2µ2
3150 4k7
3151 68k
2162 22µ
7110 BC858B
3164 4E7
3167 220E
3154 220E
2130 22n
3155 330E
2144 1µ
6107 BZX79/C11
3146 47E
2142 100n
2143 220n
VCC1 +8V
VDD
VCC2 +9,6V
AM FM
+8V VCC1
7103 BC858C
3186 1k
3143 22k
3144 1k
2158 100n
3188 0E
3184 0E
2129 1µ
2151 15p
2152 82p
5107 Toko 7KM
3183 0E
2128 10µ
3185 0E
2141 100n
3162 150k
2161 1n
2160 12p
5121 75 kHz
2127 220n
3141 56k
3142 100k
3145 2k2
2132 470n
2131 470n
VCO
75 kHz
5115
ANTI BIRDY FILTER
1103
AM-FRAME SOCKET
LW = 0,7V MW = 0V
3108 2k2
7104 BC338-40
5102
MW
7105 BC338-40
3109 2k2
2108 82p
2109 27p
5103
LW
2106 5p2-30p
6105a HN1V02H
6105b HN1V02H
2107 470n
3123 0E
3132 0E
3124 0E
MW-OSC
5123
2120 33p
3134 22k
2125 560p
LW-OSC
5122
2123 390p
2122 3n9
3169 0E
3137 10k
LW = 0V MW = 0,7V
7124 BC848C
3163 0E
3129 0E
3130 0E
7122 BC848C
LW = 0,7V MW = 0V
3128 2k2
3177 22k
3131 0E
7109 BC858B
3197 4k7
3125 10k
MW LW
FM mode stereo
FM
AM
Signal path
FM
AM
AF
only in RDS version (04121)
not in RDS version (04341)
3104 217 04121/04341 bl. 130 - 01
LEU0150 9752

MISCELLANEOUS

1102	4822 267 10283	Socket Coaxial IEC 75R
1103	4822 265 31184	JST Connector 2 pin
1110	4822 210 10739	Frontend Assembly FE415-G23

CAPACITORS

2102	4822 124 40433	47µF 20% 25V
2106	4822 125 60102	Trimmer 5,2-30pF 100V
2107	4822 121 51252	470nF 5% 63V
2108	4822 126 13695	82pF 1% 63V
2109	4822 126 13691	27pF 1% 63V
2120	5322 122 32659	33pF 5% 50V
2122	5322 126 10465	3,9nF 10% 63V
2125	4822 121 10578	560P 1% 630V
2127	4822 122 32927	220nF +80/-20% 50V
2128	4822 124 41579	10µF 20% 50V
2129	4822 124 40242	1µF 20% 63V
2130	4822 126 11585	22nF +80/-20% 25V
2131	4822 122 33325	470nF 16V
2132	4822 122 33325	470nF 16V
2133	4822 124 40242	1µF 20% 63V
2134	4822 126 13188	15nF 5% 63V
2135	4822 122 32927	220nF +80/-20% 50V
2136	4822 126 13188	15nF 5% 63V
2137	4822 122 32927	220nF +80/-20% 50V
2138	4822 124 41576	2,2µF 20% 50V
2140	4822 121 51252	470nF 5% 63V
2141	4822 122 31947	100nF 20% 63V
2142	4822 122 31947	100nF 20% 63V
2143	4822 122 32927	220nF +80/-20% 50V
2144	4822 124 40242	1µF 20% 63V
2145	4822 122 33575	220pF 5% 50V
2147	4822 122 33575	220pF 5% 50V
2148	4822 122 33809	22nF 20% 50V
2150	4822 122 31947	100nF 20% 63V
2151	4822 126 14236	50V 15pF 5%
2152	4822 126 13695	82pF 1% 63V
2158	4822 122 31947	100nF 20% 63V
2160	4822 122 32139	12pF 2% 63V
2161	5322 122 34123	1nF 10% 50V
2162	4822 124 81151	22µF 50V

RESISTORS

3103	4822 051 20008	0R Jumper 0805
3104	4822 051 10102	1k 2% 0,25W
3107	4822 051 20829	82R 5% 0,1W
3108	4822 117 11449	2k2 1% 0,1W
3109	4822 117 11449	2k2 1% 0,1W
3123	4822 051 10008	0R 5% 0,25W
3124	4822 051 10008	0R 5% 0,25W
3125	4822 116 83864	10k 5% 0,5W
3128	4822 116 52256	2k2 5% 0,5W
3129	4822 051 20008	0R Jumper 0805
3130	4822 051 10008	0R 5% 0,25W
3131	4822 051 10008	0R 5% 0,25W
3132	4822 051 20008	0R Jumper 0805
3134	4822 051 20223	22k 5% 0,1W
3137	4822 117 10833	10k 1% 0,1W
3138	4822 051 20008	0R Jumper 0805
3139	4822 051 10008	0R 5% 0,25W
3140	4822 051 20331	330R 5% 0,1W
3141	4822 051 20563	56k 5% 0,1W
3142	4822 100 11163	Trimmer 100k 30% 0,1W
3143	4822 051 20223	22k 5% 0,1W
3144	4822 051 10102	1k 2% 0,25W
3145	4822 117 11449	2k2 1% 0,1W
3146	4822 051 20479	47R 5% 0,1W
3150	4822 051 20472	4k7 5% 0,1W
3151	4822 051 20683	68k 5% 0,1W
3152	4822 051 20471	470R 5% 0,1W
3153	4822 051 20471	470R 5% 0,1W
3154	4822 116 83872	220R 5% 0,5W
3155	4822 116 52219	330R 5% 0,5W
3158	4822 116 83883	470R 5% 0,5W
3159	4822 116 83883	470R 5% 0,5W
3160	4822 116 83883	470R 5% 0,5W
3161	4822 116 83883	470R 5% 0,5W
3162	4822 051 20224	220k 5% 0,1W
3163	4822 051 10008	0R 5% 0,25W
3164	4822 052 10478 ⚠	4R7 5% 0,33W
3165	4822 051 10008	0R 5% 0,25W
3167	4822 116 83872	220R 5% 0,5W
3169	4822 051 20008	0R Jumper 0805
3171	4822 051 20008	0R Jumper 0805
3172	4822 051 10008	0R 5% 0,25W
3173	4822 051 20008	0R Jumper 0805
3176	4822 051 20008	0R Jumper 0805
3177	4822 051 20223	22k 5% 0,1W
3181	4822 051 10008	0R 5% 0,25W
3183	4822 051 10008	0R 5% 0,25W
3184	4822 051 10008	0R 5% 0,25W
3185	4822 051 10008	0R 5% 0,25W
3186	4822 051 10102	1k 2% 0,25W
3188	4822 051 10008	0R 5% 0,25W
3192	4822 051 20008	0R Jumper 0805
3197	4822 051 20472	4k7 5% 0,1W

COILS & FILTERS

5102	4822 157 71634	MW AERIAL
5103	4822 157 71635	LW AERIAL
5107	4822 157 11443	FM Discriminator 10,7MHz
5109	4822 157 71639	Ceram Filter 10,7MHz
5110	4822 242 70665	Ceram Filter 10,7MHz
5111	4822 158 60511	AM-IF Filter 450kHz
5112	4822 157 70302	AM-IF Filter 450kHz

5114	4822 157 70302	AM-IF Filter 450kHz
5115	4822 157 71636	Anti-Birdy Filter
5121	4822 242 10261	X'tal Resonator 75kHz
5122	4822 157 60517	RF Coil AM
5123	4822 157 60517	RF Coil AM

DIODES

6105	4822 130 83075	HN1V02H-B
6107	4822 130 34488	BZX79-B11
6120	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1
7103	4822 130 42513	BC858C
7104	5322 130 44779	BC338-40
7105	5322 130 44779	BC338-40
7109	5322 130 41983	BC858B
7110	5322 130 41983	BC858B
7122	5322 130 42136	BC848C
7124	5322 130 42136	BC848C

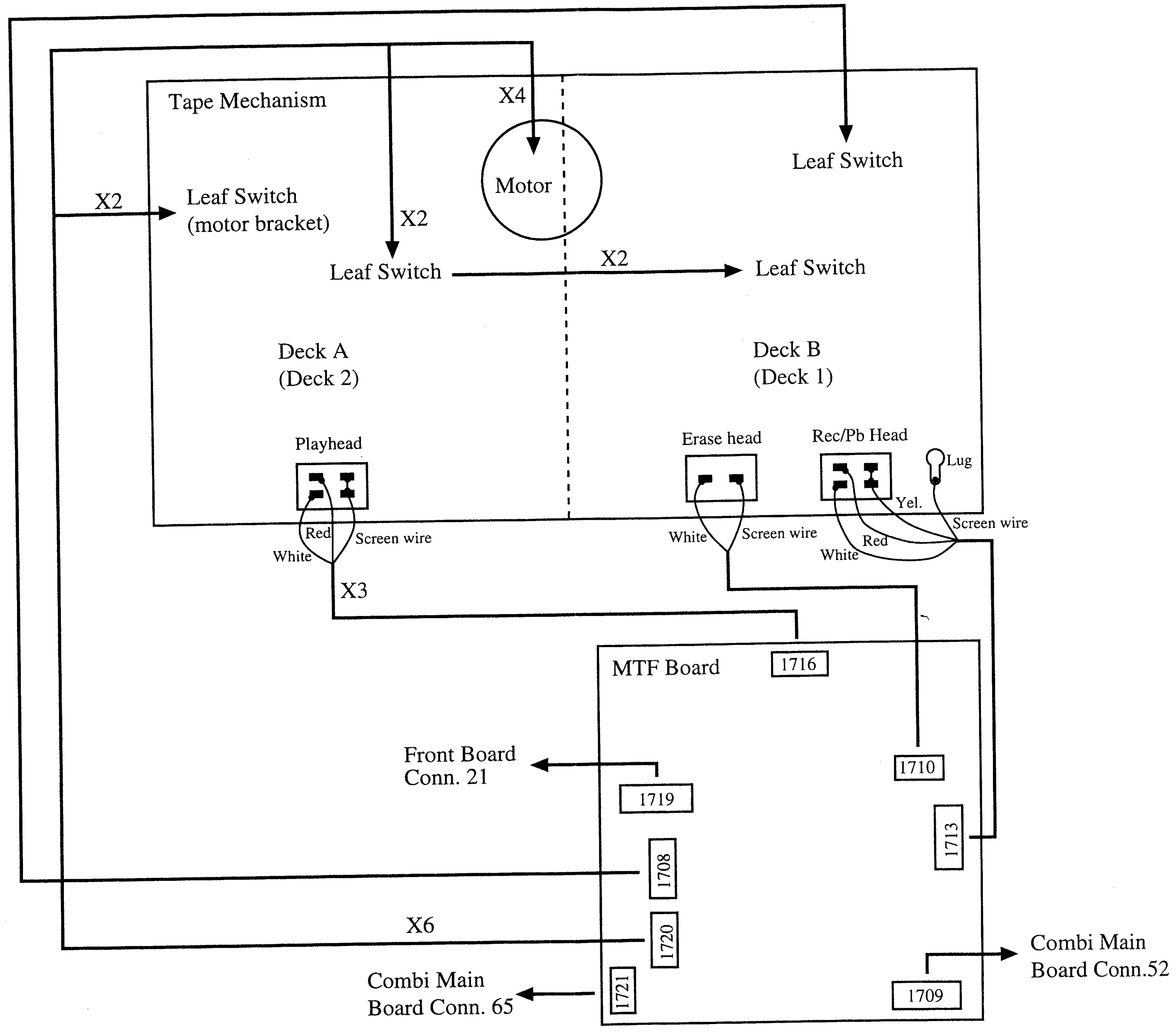
Note: Only the parts mentioned in this list are normal service spare parts.

MTF MODULE

TABLE OF CONTENTS

Tape Module Wiring & Adjustment table 9-1
Circuit Diagram 9-2
Layout Diagram 9-3
Exploded views & parts list.. 9-4
Electrical parts list.. 9-5

Tape Deck Wiring Diagram



Tape Mechanism
X4
Motor
Leaf Switch
X2
Leaf Switch
(motor bracket)
X2
Leaf Switch
X2
Leaf Switch
Deck A
(Deck 2)
Deck B
(Deck 1)
Playhead
Erase head
Rec/Pb Head
Lug
Yel.
Red
White
Screen wire
White
Screen wire
Red
White
Screen wire
X3
MTF Board
1716
Front Board
Conn. 21
1719
1710
1713
1708
X6
1720
Combi Main
Board Conn. 65
1721
1709
Combi Main
Board Conn.52

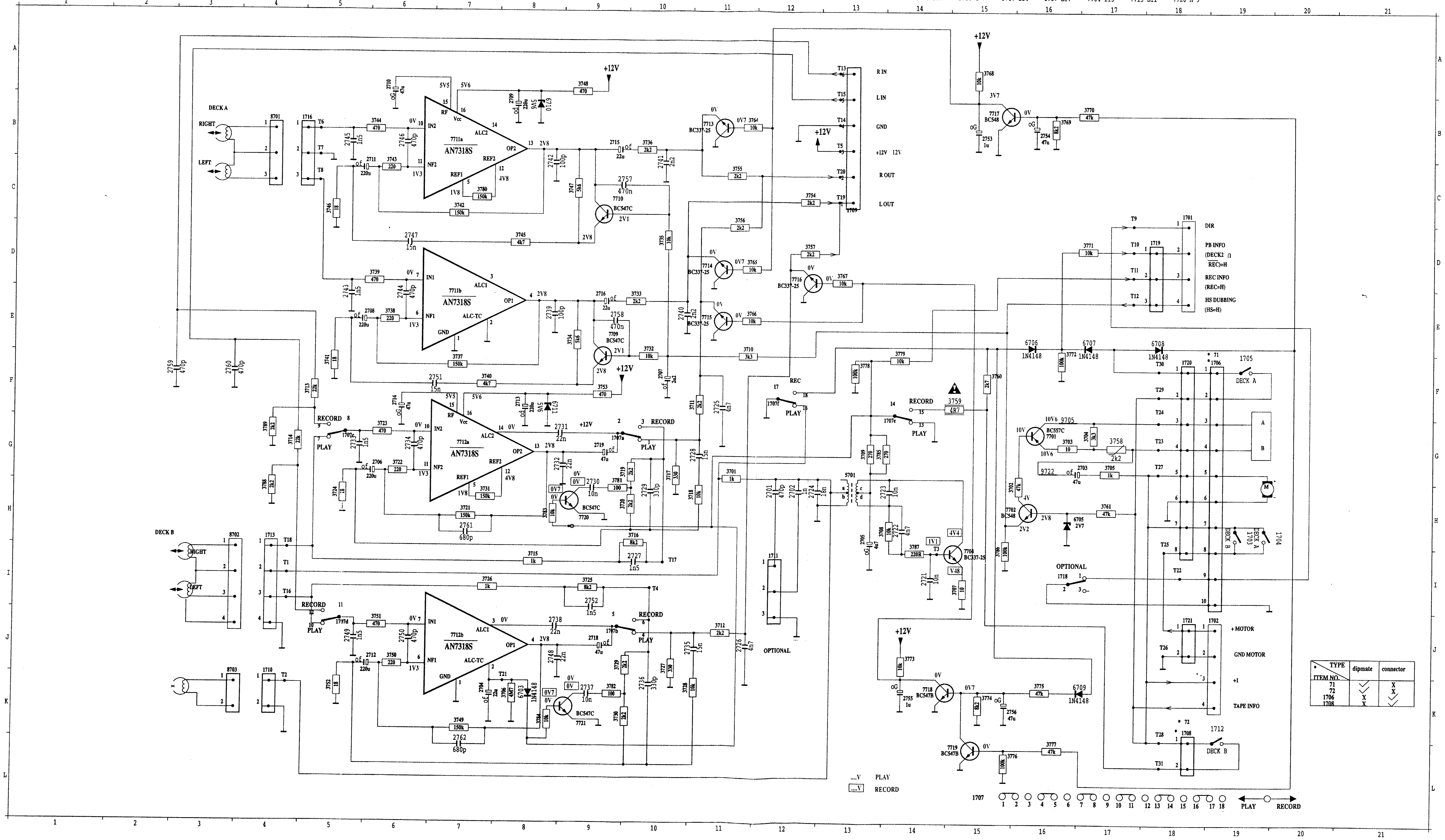
TAPE MECHANISM ADJUSTMENT

ADJUSTMENT	CASSETTE	DECK 1 (DECK B)	DECK 2 (DECK A)	MEASURE ON	READ ON	ADJUST WITH	ADJUST TO
Azimuth	10kHz	Play	-	L & R out T019/T020	mV-meter	Left hand screw of Play or R/P head	Maximum L = R
	SBC420*	-	Play				
Motor speed	3150Hz	Play	-	L & R out T019/T020	Wow and Futter meter	3758	**a
	SBC420*	-	Play				

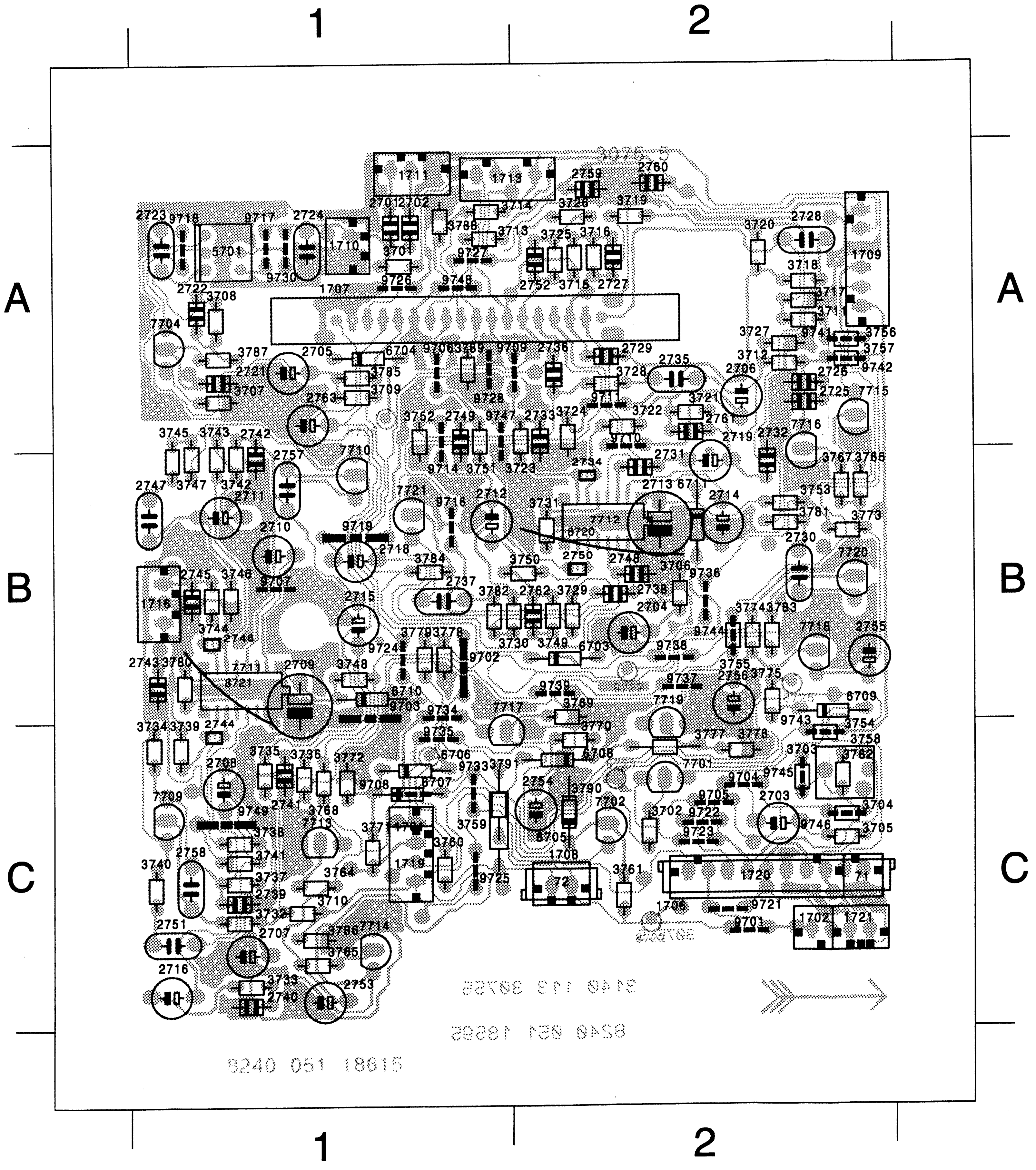
* SBC 420: 4822 397 30071
**a: The maximum permissible speed deviation is +3/-2%.
Moreover, the Wow & Flutter value can be read.
This value should not exceed 0.4%.

CIRCUIT DIAGRAM

1701	C18
1702	J19
1703	H19
1704	H20
1705	F19
1706	F19
1707a	G 9
1707b	J 9
1707c	G 5
1707d	J 5
1707e	G14
1707f	F12
1708	K18
1709	C13
1710	K 4
1711	I12
1712	K19
1713	H 4
1716	B 4
1718	I16
1719	D18
1720	F18
1721	J18
2701	H12
2702	H12
2703	G17
2704	K 7
2705	H13
2706	G 6
2707	F10
2708	E 6
2709	B 8
2710	A 6
2711	C 6
2712	J 6
2713	F 8
2714	F 6
2715	B 9
2716	E 9
2718	J 9
2719	G 9
2721	I14
2722	H14
2723	H14
2724	H12
2725	F11
2726	J11
2727	I10
2728	G11
2729	H10
2730	H 9
2731	G 8
2732	G 8
2733	G 5
2734	G 6
2735	J11
2736	K10
2737	K 9
2738	J 8
2739	E 8
2740	E10
2741	C10
2742	C 8
2743	E 5
2744	E 6
2745	B 5
2746	B 6
2747	D 6
2748	J 8
2749	J 5
2750	J 6
2751	F 7
2752	I 9
2753	B15
2754	B16
2755	K14
2756	K16
2757	C 9
2758	E 9
2759	F 2
2760	F 3
2761	H 7
2762	L 7
3701	G11
3702	H15
3703	G16
3704	G17
3705	G17
3706	K 8
3707	I15
3708	H13
3709	G13
3710	E11
3711	F11
3712	J11
3713	F 5
3714	G 4
3715	I 8
3716	H10
3717	G10
3718	H11
3719	G 9
3720	H 9
3721	H 7
3722	G 6
3723	G 6
3724	H 5
3725	I 9
3726	I 7
3727	J10
3728	K10
3729	J 9
3730	K 9
3731	H 7
3732	E10
3733	E10
3734	E 9
3735	D10
3736	B10
3737	F 7
3738	E 6
3739	D 6
3740	F 7
3741	F 5
3742	C 7
3743	C 6
3744	B 6
3745	D 8
3746	C 5
3747	C 9
3748	A 9
3749	K 7
3750	J 6
3751	J 6
3752	K 5
3753	F 9
3754	C12
3755	C11
3756	C11
3757	D12
3758	G17
3759	F15
3760	F15
3761	H17
3764	B11
3765	D11
3766	E11
3767	D13
3768	A15
3769	B16
3770	B17
3771	D17
3772	F16
3773	J14
3774	K15
3775	K16
3776	L16
3777	L16
3778	F13
3779	F14
3780	C 7
3781	H 9
3782	K 9
3783	H 8
3784	K 8
3785	G13
3786	I15
3787	I14
3788	H 4
3789	G 4
5701	G13
6703	K 8
6705	H17
6706	E16
6707	E17
6708	E18
6709	K17
6710	B 8
6711	F 8
7701	G16
7702	H16
7704	I15
7709	E 9
7710	C 9
7711a	B 7
7711b	E 7
7712a	G 7
7712b	J 7
7713	B11
7714	D11
7715	E11
7716	D12
7717	B15
7718	K14
7719	L15
7720	H 9
7721	K 9
8701	B 4
8702	H 3
8703	K 3
9705	G16
9722	G16

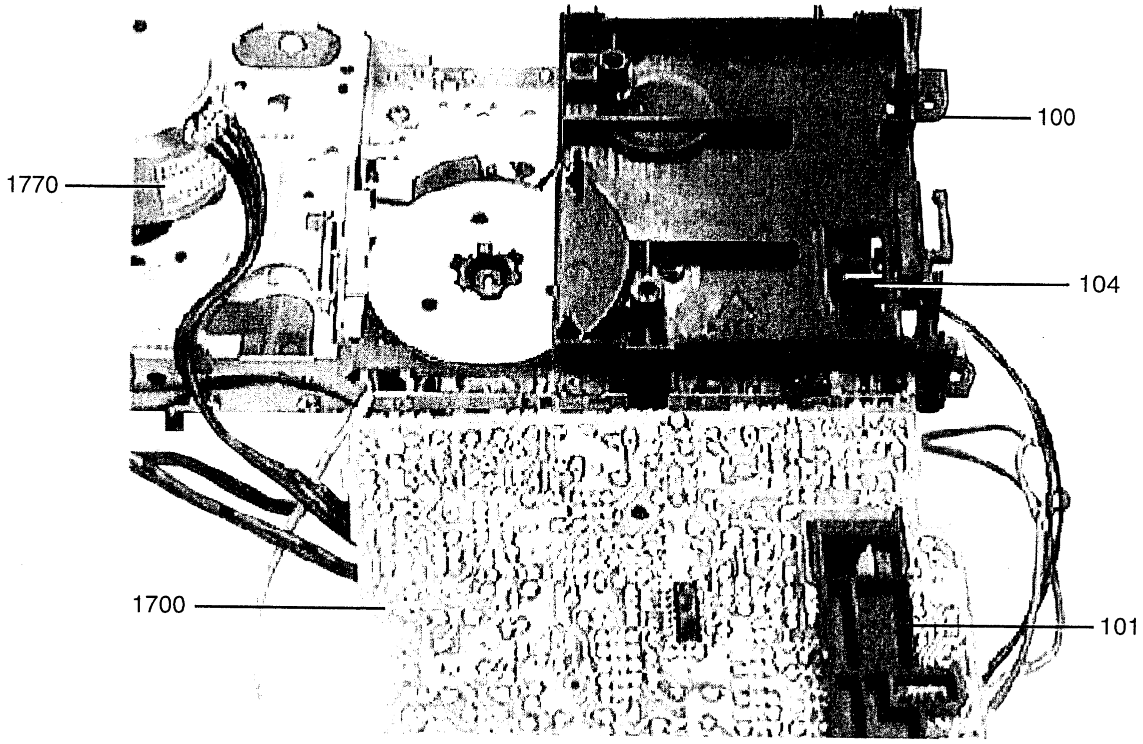

DECK A
RIGHT
LEFT
DECK B
7711a AN7318S
7711b AN7318S
7712a AN7318S
7712b AN7318S
+12V
R IN
L IN
GND
+12V 12V
R OUT
L OUT
DIR
PB INFO
REC INFO
HS DUBBING
RECORD
PLAY
REC
OPTIONAL
+MOTOR
GND MOTOR
TAPE INFO
DECK A
DECK B
1707
PLAY
RECORD
....V PLAY
....V RECORD

* TYPE / ITEM NO.	dipmate	connector
71	✓	X
72	✓	X
1706	X	✓
1708	X	✓



71	C 2	2744	C 1	3737	C 1	6704	A 1	9741	A 2
72	C 2	2745	B 1	3738	C 1	6705	C 2	9742	A 2
1701	C 1	2746	B 1	3739	C 1	6706	C 1	9743	C 2
1702	C 2	2747	B 1	3740	C 1	6707	C 1	9744	B 2
1706	C 2	2748	B 2	3741	C 1	6708	C 2	9745	C 2
1707	A 1	2749	A 1	3742	B 1	6709	B 2	9746	C 2
1708	C 2	2750	B 2	3743	B 1	6710	B 1	9747	A 1
1709	A 2	2751	C 1	3744	B 1	6711	B 2	9748	A 1
1710	A 1	2752	A 2	3745	B 1	7701	C 2	9749	C 1
1711	A 1	2753	C 1	3746	B 1	7702	C 2		
1713	A 1	2754	C 2	3747	B 1	7704	A 1		
1716	B 1	2755	B 2	3748	B 1	7709	C 1		
1719	C 1	2756	B 2	3749	B 2	7710	B 1		
1720	C 2	2757	B 1	3750	B 2	7711	B 1		
1721	C 2	2758	C 1	3751	A 1	7712	B 2		
2701	A 1	2759	A 2	3752	A 1	7713	C 1		
2702	A 1	2760	A 2	3753	B 2	7714	C 1		
2703	C 2	2761	A 2	3754	C 2	7715	A 2		
2704	B 2	2762	B 2	3755	B 2	7716	B 2		
2705	A 1	2763	A 1	3756	A 2	7717	C 1		
2706	A 2	3701	A 1	3757	A 2	7718	B 2		
2707	C 1	3702	C 2	3758	C 2	7719	C 2		
2708	C 1	3703	C 2	3759	C 1	7720	B 2		
2709	B 1	3704	C 2	3760	C 1	7721	B 1		
2710	B 1	3705	C 2	3761	C 2	9701	C 2		
2711	B 1	3706	B 2	3762	C 2	9702	B 1		
2712	B 1	3707	A 1	3764	C 1	9703	B 1		
2713	B 2	3708	A 1	3765	C 1	9704	C 2		
2714	B 2	3709	A 1	3766	B 2	9705	C 2		
2715	B 1	3710	C 1	3767	B 2	9706	A 1		
2716	C 1	3711	A 2	3768	C 1	9707	B 1		
2718	B 1	3712	A 2	3769	B 2	9708	C 1		
2719	B 2	3713	A 1	3770	C 2	9709	A 2		
2721	A 1	3714	A 1	3771	C 1	9710	A 2		
2722	A 1	3715	A 2	3772	C 1	9711	A 2		
2723	A 1	3716	A 2	3773	B 2	9714	A 1		
2724	A 1	3717	A 2	3774	B 2	9716	B 1		
2725	A 2	3718	A 2	3775	B 2	9717	A 1		
2726	A 2	3719	A 2	3776	C 2	9718	A 1		
2727	A 2	3720	A 2	3777	C 2	9719	B 1		
2728	A 2	3721	A 2	3778	B 1	9721	C 2		
2729	A 2	3722	A 2	3779	B 1	9722	C 2		
2730	B 2	3723	A 2	3780	B 1	9723	C 2		
2731	B 2	3724	A 2	3781	B 2	9724	B 1		
2732	B 2	3725	A 2	3782	B 1	9725	C 1		
2733	A 2	3726	A 2	3783	B 2	9726	A 1		
2734	B 2	3727	A 2	3784	B 1	9727	A 1		
2735	A 2	3728	A 2	3785	A 1	9728	A 1		
2736	A 2	3729	B 2	3786	C 1	9730	A 1		
2737	B 1	3730	B 2	3787	A 1	9733	C 1		
2738	B 2	3731	B 2	3788	A 1	9734	B 1		
2739	C 1	3732	C 1	3789	A 1	9735	C 1		
2740	C 1	3733	C 1	3790	C 2	9736	B 2		
2741	C 1	3734	C 1	3791	C 1	9737	B 2		
2742	B 1	3735	C 1	5701	A 1	9738	B 2		
2743	B 1	3736	C 1	6703	B 2	9739	B 2		

MTF MODULE PICTURE


100
1770
104
1700
101

MECHANICAL PARTS LIST - MTF MODULE

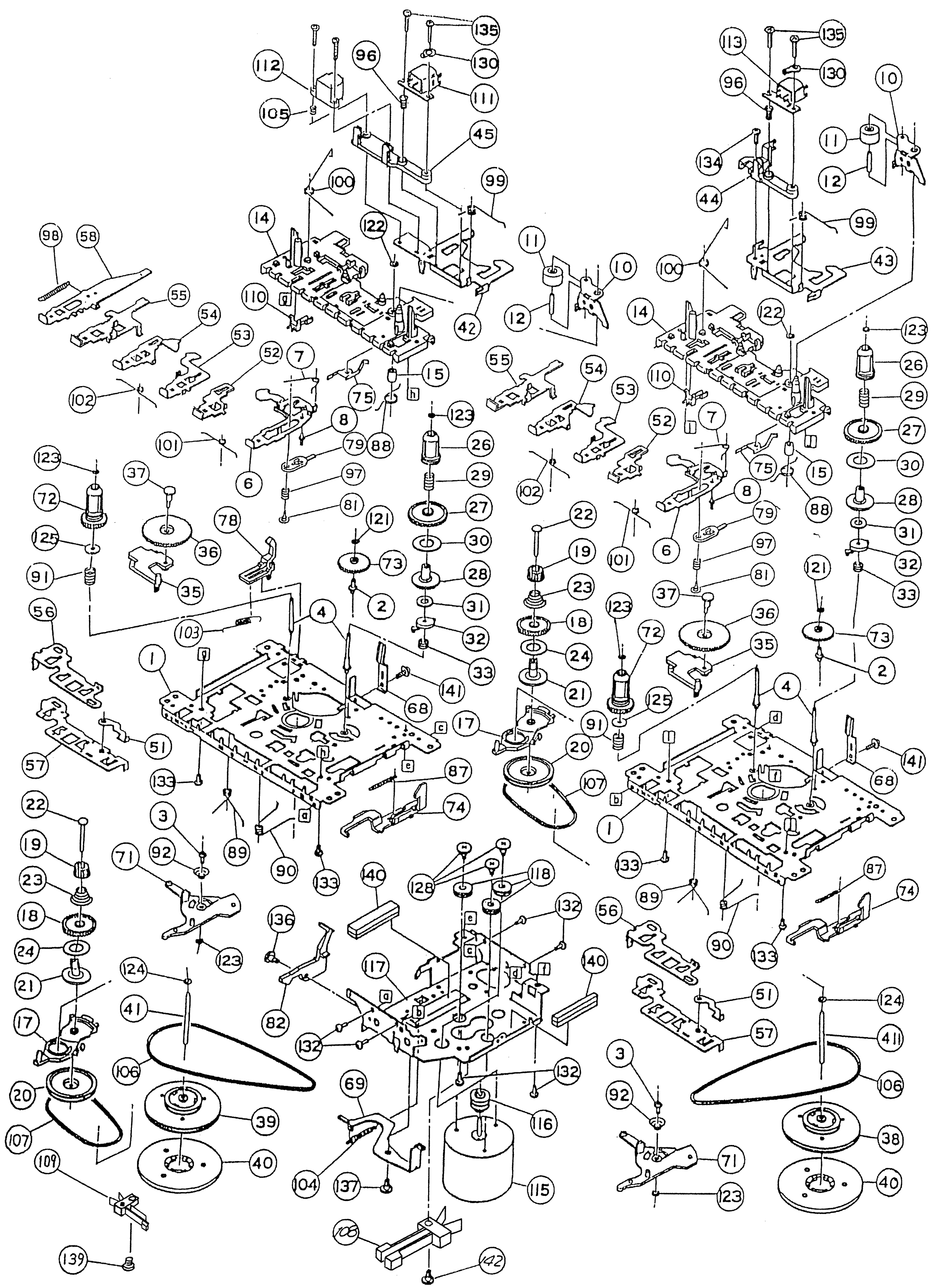
MTF MODULE		
101	4822 402 10126	Lever Recording
104	4822 492 11061	Spring Recording
1770	4822 691 10669	Tape Mechanism CDS-83WPC

Note: Only the parts mentioned in this list are normal service spare parts.

TAPE MECHANISM		
10-12	4822 528 11189	Pinch Roller Assembly
17-24	4822 402 10966	FR Arm Assembly
38-41	4822 528 11242	Flywheel (W) Assembly
39-41	4822 528 11243	Flywheel Assembly
106	4822 358 31225	Main Belt (W2) 1.1x59.5
107	4822 358 31124	Sub Belt
108	4822 277 11753	Leaf Switch
109	4822 277 11754	Leaf Switch
110	4822 278 90663	Leaf Switch
111	4822 249 30218	Rec/PB Head
112	4822 249 10548	Erase Head
113	4822 249 30218	Play Head
115-116	4822 361 11053	Motor Assembly
118	4822 466 11787	Motor Cushion
122	4822 532 12937	Washer PSW-S 1.6x3.5x0.4

Note: Only the parts mentioned in this list are normal service spare parts.

TAPE MECHANISM


135
112
96
130
111
105
45
113
135
130
10
96
11
134
12
44
99
100
99
98
58
14
122
43
11
10
100
55
110
12
42
14
122
123
54
53
26
52
7
15
55
29
102
75
54
27
8
53
30
101
79
88
110
123
26
52
7
28
123
97
29
102
75
15
31
72
37
81
27
8
88
32
121
30
22
79
125
78
36
73
28
101
6
97
33
91
35
2
31
19
37
81
121
56
4
32
23
123
36
103
33
18
72
73
1
141
24
35
68
21
125
2
17
91
4
57
51
20
141
133
87
107
1
68
22
3
74
19
71
92
89
133
23
90
133
140
128
118
87
18
132
56
89
74
24
136
90
133
123
117
140
21
124
51
41
124
17
82
132
57
41
106
132
3
106
20
69
39
116
92
38
107
40
109
71
104
137
115
40
123
108
139
142

ELECTRICAL PARTS LIST - MTF BOARD

MISCELLANEOUS

1707	4822 277 11504	Recording Switch

CAPACITORS

2703	4822 124 40433	47µF 20% 25V
2704	4822 124 81151	22µF 50V
2705	4822 124 40246	4,7µF 20% 63V
2706	4822 124 12068	220µF 20% 10V
2707	4822 124 41576	2,2µF 20% 50V
2708	4822 124 12068	220µF 20% 10V
2709	4822 124 80144	220µF 20% 25V
2710	4822 124 40433	47µF 20% 25V
2711	4822 124 12068	220µF 20% 10V
2712	4822 124 12068	220µF 20% 10V
2713	4822 124 80144	220µF 20% 25V
2714	4822 124 40433	47µF 20% 25V
2715	4822 124 81151	22µF 50V
2716	4822 124 81151	22µF 50V
2718	4822 124 40433	47µF 20% 25V
2719	4822 124 40433	47µF 20% 25V
2721	4822 121 51387	10nF 20% 16V
2722	4822 126 11714	4,7nF 20%
2723	4822 121 41857	10nF 5% 250V
2724	4822 121 51306	18nF 10% 50V
2725	4822 126 11714	4,7nF 20%
2726	4822 126 11714	4,7nF 20%
2727	4822 126 12878	1,5nF 10% 16V
2728	4822 121 51305	15nF 10% 50V
2729	4822 126 12787	330pF 10% 50V
2730	4822 121 51304	10nF 10% 50V
2731	4822 126 11585	22nF +80/-20% 25V
2732	4822 126 11585	22nF +80/-20% 25V
2733	4822 126 12878	1,5nF 10% 16V
2734	5322 122 32311	470pF 10% 100V
2735	4822 121 51305	15nF 10% 50V
2736	4822 126 12787	330pF 10% 50V
2737	4822 121 51304	10nF 10% 50V
2738	4822 126 11585	22nF +80/-20% 25V
2739	4822 122 33195	100pF 10% 50V
2740	4822 126 12339	2,2nF 10% Y5R
2741	4822 126 12339	2,2nF 10% Y5R
2742	4822 122 33195	100pF 10% 50V
2743	4822 126 12878	1,5nF 10% 16V
2744	5322 122 32311	470pF 10% 100V
2745	4822 126 12878	1,5nF 10% 16V
2746	5322 122 32311	470pF 10% 100V
2747	4822 121 51305	15nF 10% 50V
2748	4822 126 11585	22nF +80/-20% 25V
2749	4822 126 12878	1,5nF 10% 16V
2750	5322 122 32311	470pF 10% 100V
2751	4822 121 51305	15nF 10% 50V
2752	4822 126 12878	1,5nF 10% 16V
2753	4822 124 40242	1µF 20% 63V
2754	4822 124 40433	47µF 20% 25V
2755	4822 124 40242	1µF 20% 63V
2756	4822 124 40433	47µF 20% 25V
2757	4822 121 51252	470nF 5% 63V
2758	4822 121 51252	470nF 5% 63V
2759	4822 122 33519	470pF 10% 50V
2760	4822 122 33519	470pF 10% 50V
2761	4822 126 14316	680pF 10% 50V
2762	4822 126 14316	680pF 10% 50V

RESISTORS

3701	4822 050 21002	1k 1% 0,6W
3702	4822 116 83884	47k 5% 0,5W
3703	4822 050 11009	10R 1% 0,4W
3704	4822 050 13302	3k3 1% 0,4W
3705	4822 050 21002	1k 1% 0,6W
3706	4822 111 30893	4M7 5% 0,2W
3707	4822 116 52176	10R 5% 0,5W
3708	4822 050 11003	10k 1% 0,4W
3709	4822 111 20434	270R
3710	4822 116 52269	3k3 5% 0,5W
3711	4822 050 12202	2k2 1% 0,4W
3712	4822 050 12202	2k2 1% 0,4W
3713	4822 116 52257	22k 5% 0,5W
3714	4822 116 52257	22k 5% 0,5W
3715	4822 050 11002	1k 1% 0,4W
3716	4822 050 18202	8k2 1% 0,4W
3717	4822 116 52219	330R 5% 0,5W
3718	4822 050 11003	10k 1% 0,4W
3719	4822 050 12202	2k2 1% 0,4W
3720	4822 050 12202	2k2 1% 0,4W
3721	4822 116 52245	150k 5% 0,5W
3722	4822 116 83872	220R 5% 0,5W
3723	4822 116 83883	470R 5% 0,5W
3724	4822 116 52184	18R 5% 0,5W
3725	4822 050 18202	8k2 1% 0,4W
3726	4822 050 11002	1k 1% 0,4W
3727	4822 116 52219	330R 5% 0,5W
3728	4822 050 11003	10k 1% 0,4W
3729	4822 050 12202	2k2 1% 0,4W
3730	4822 050 12202	2k2 1% 0,4W
3731	4822 116 52245	150k 5% 0,5W
3732	4822 116 83864	10k 5% 0,5W
3733	4822 116 52256	2k2 5% 0,5W
3734	4822 050 15602	5k6 1% 0,4W
3735	4822 116 83864	10k 5% 0,5W
3736	4822 116 52256	2k2 5% 0,5W
3737	4822 116 52245	150k 5% 0,5W
3738	4822 116 83872	220R 5% 0,5W
3739	4822 116 83883	470R 5% 0,5W
3740	4822 116 52283	4k7 5% 0,5W
3741	4822 116 52184	18R 5% 0,5W

ELECTRICAL PARTS LIST - MTF BOARD

RESISTORS

3742	4822 116 52245	150k 5% 0,5W
3743	4822 116 83872	220R 5% 0,5W
3744	4822 116 83883	470R 5% 0,5W
3745	4822 116 52283	4k7 5% 0,5W
3746	4822 116 52184	18R 5% 0,5W
3747	4822 050 15602	5k6 1% 0,4W
3748	4822 116 83883	470R 5% 0,5W
3749	4822 116 52245	150k 5% 0,5W
3750	4822 116 83872	220R 5% 0,5W
3751	4822 116 83883	470R 5% 0,5W
3752	4822 116 52184	18R 5% 0,5W
3753	4822 116 83883	470R 5% 0,5W
3754	4822 050 12202	2k2 1% 0,4W
3755	4822 050 12202	2k2 1% 0,4W
3756	4822 050 12202	2k2 1% 0,4W
3757	4822 050 12202	2k2 1% 0,4W
3758	4822 101 11166	Trimmer 2k2
3759	4822 052 10478 ⚠	4R7 5% 0,33W
3760	4822 050 12702	2k7 1% 0,4W
3761	4822 116 83884	47k 5% 0,5W
3764	4822 116 83864	10k 5% 0,5W
3765	4822 116 83864	10k 5% 0,5W
3766	4822 050 11003	10k 1% 0,4W
3767	4822 050 11003	10k 1% 0,4W
3768	4822 116 83864	10k 5% 0,5W
3769	4822 050 18202	8k2 1% 0,4W
3770	4822 116 83884	47k 5% 0,5W
3771	4822 116 83864	10k 5% 0,5W
3772	4822 116 52234	100k 5% 0,5W
3773	4822 050 11003	10k 1% 0,4W
3774	4822 050 18202	8k2 1% 0,4W
3775	4822 116 83884	47k 5% 0,5W
3776	4822 050 11004	100k 1% 0,4W
3777	4822 116 83884	47k 5% 0,5W
3778	4822 116 52234	100k 5% 0,5W
3779	4822 116 83864	10k 5% 0,5W
3780	4822 050 11504	150k 1% 0,4W
3781	4822 050 11001	100R 1% 0,4W
3782	4822 050 11001	100R 1% 0,4W
3783	4822 116 83864	10k 5% 0,5W
3784	4822 116 83864	10k 5% 0,5W
3785	4822 111 20434	270R
3786	4822 116 52234	100k 5% 0,5W
3787	4822 116 83872	220R 5% 0,5W
3788	4822 050 12202	2k2 1% 0,4W
3789	4822 050 12202	2k2 1% 0,4W

COILS

5701	4822 157 10371	Osc Coil 100kHz

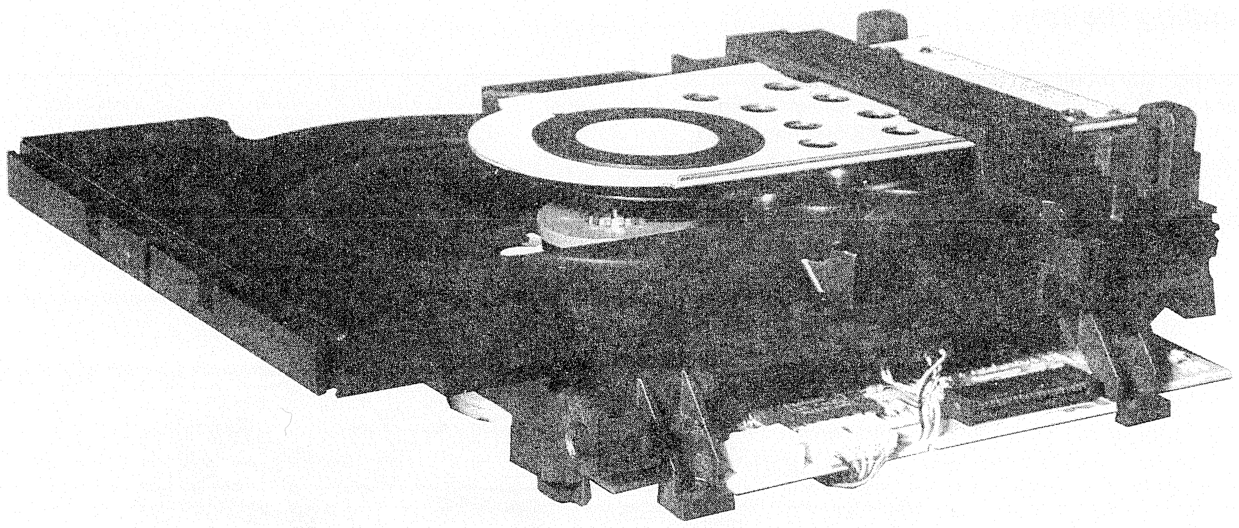
DIODES

6703	4822 130 30621	1N4148
6705	5322 130 34563	BZX79-C2V7
6706	4822 130 30621	1N4148
6707	4822 130 30621	1N4148
6708	4822 130 30621	1N4148
6709	4822 130 30621	1N4148
6710	4822 130 34173	BZX79-B5V6
6711	4822 130 34173	BZX79-B5V6

TRANSISTORS & INTEGRATED CIRCUITS

7701	4822 130 42231	BC557C
7702	4822 130 40938	BC548
7704	4822 130 40981	BC337-25
7709	4822 130 44503	BC547C
7710	4822 130 44503	BC547C
7711	4822 209 32918	AN7318S
7712	4822 209 32918	AN7318S
7713	4822 130 40981	BC337-25
7714	4822 130 40981	BC337-25
7715	4822 130 40981	BC337-25
7716	4822 130 40981	BC337-25
7717	4822 130 40938	BC548
7718	4822 130 40959	BC547B
7719	4822 130 40959	BC547B
7720	4822 130 44503	BC547C
7721	4822 130 44503	BC547C

Note: Only the parts mentioned in this list are normal service spare parts.



ECO SHORT LOADER UNIT

for Systems

TABLE OF CONTENTS

Dismantling hints 10-2
Disassembly drawings 10-2
Functional Diagram 10-5
Abbreviations 10-5

CD Board

Component Layout 10-6
Schematic Diagram 10-7

Faultfinding Tree CD 10-8
Exploded view 10-9
Partslist 10-10

Dismantling hints CD Short Loader

Dismantling the tray

a) Press open/close button to open the tray. If the tray doesn´t work, use a small screwdriver as shown in Fig.1 point 1 to move the tray outside. After the first centimetre it is possible to pull the tray out by hand.

b) Release two snaps and remove tray.

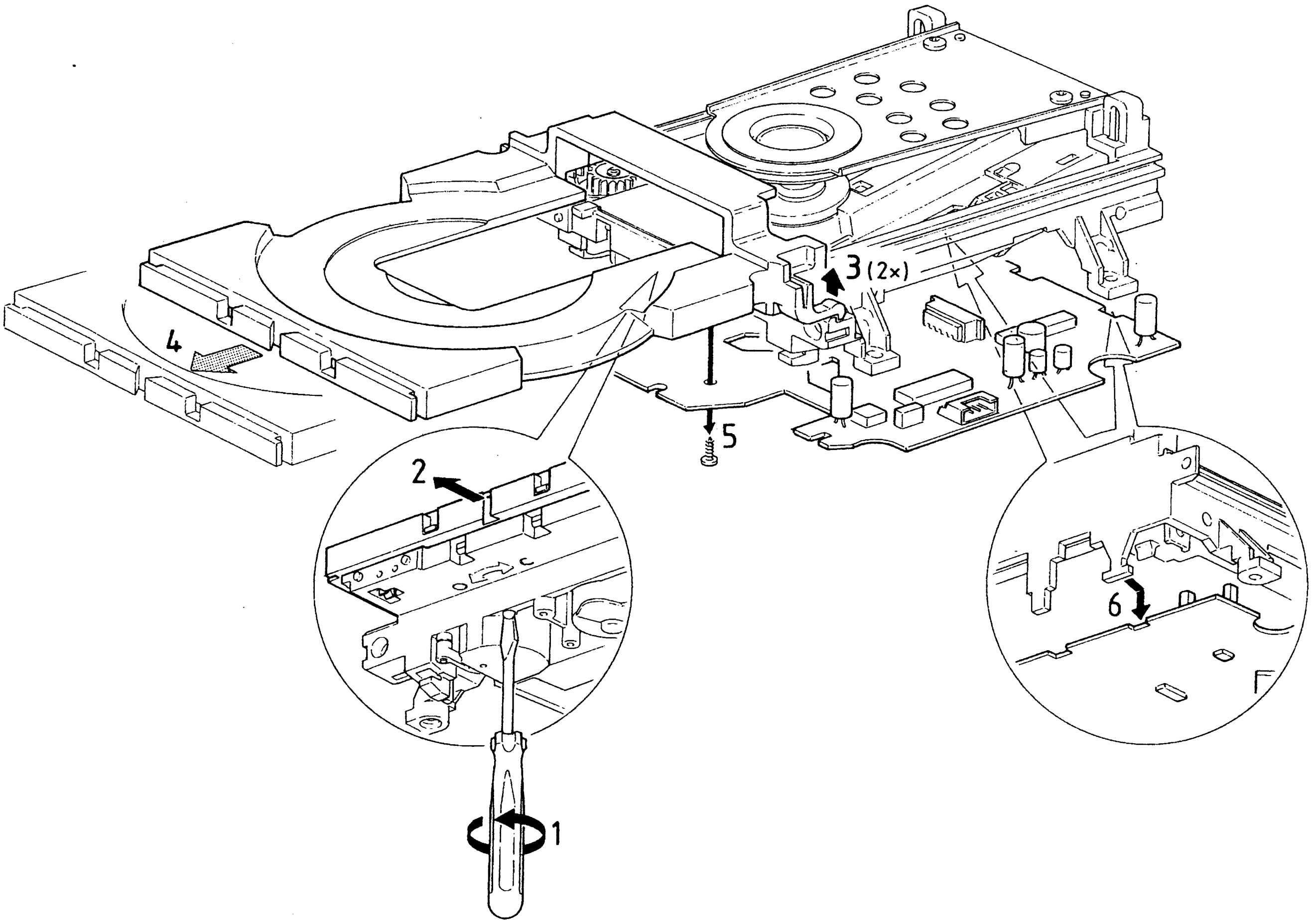


Fig. 1

Assembly of gear

a) Use a pin (e.g. a paperclip) to align the cam wheel (a) withthe gear wheel (b). See Fig. 2.

b) Fix the wheels with the small plastic whashers.

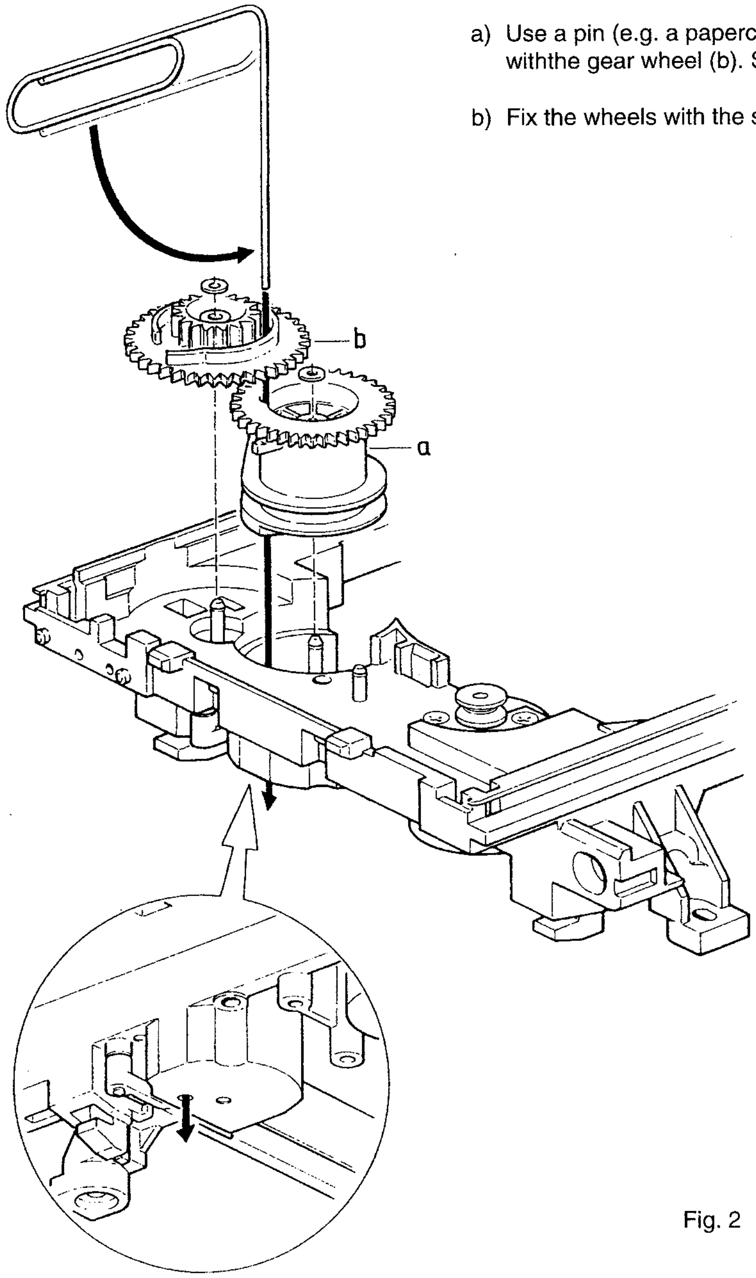
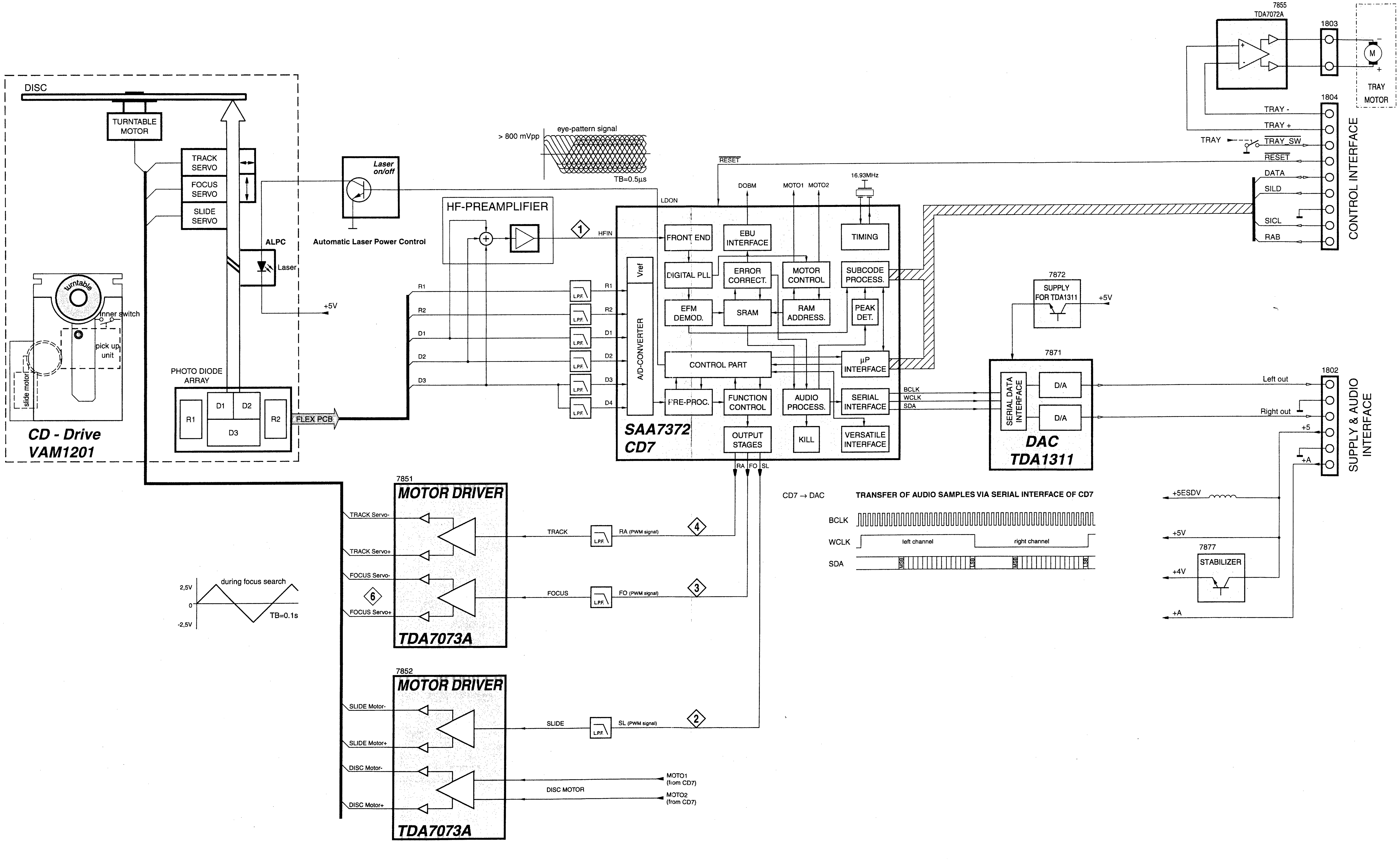
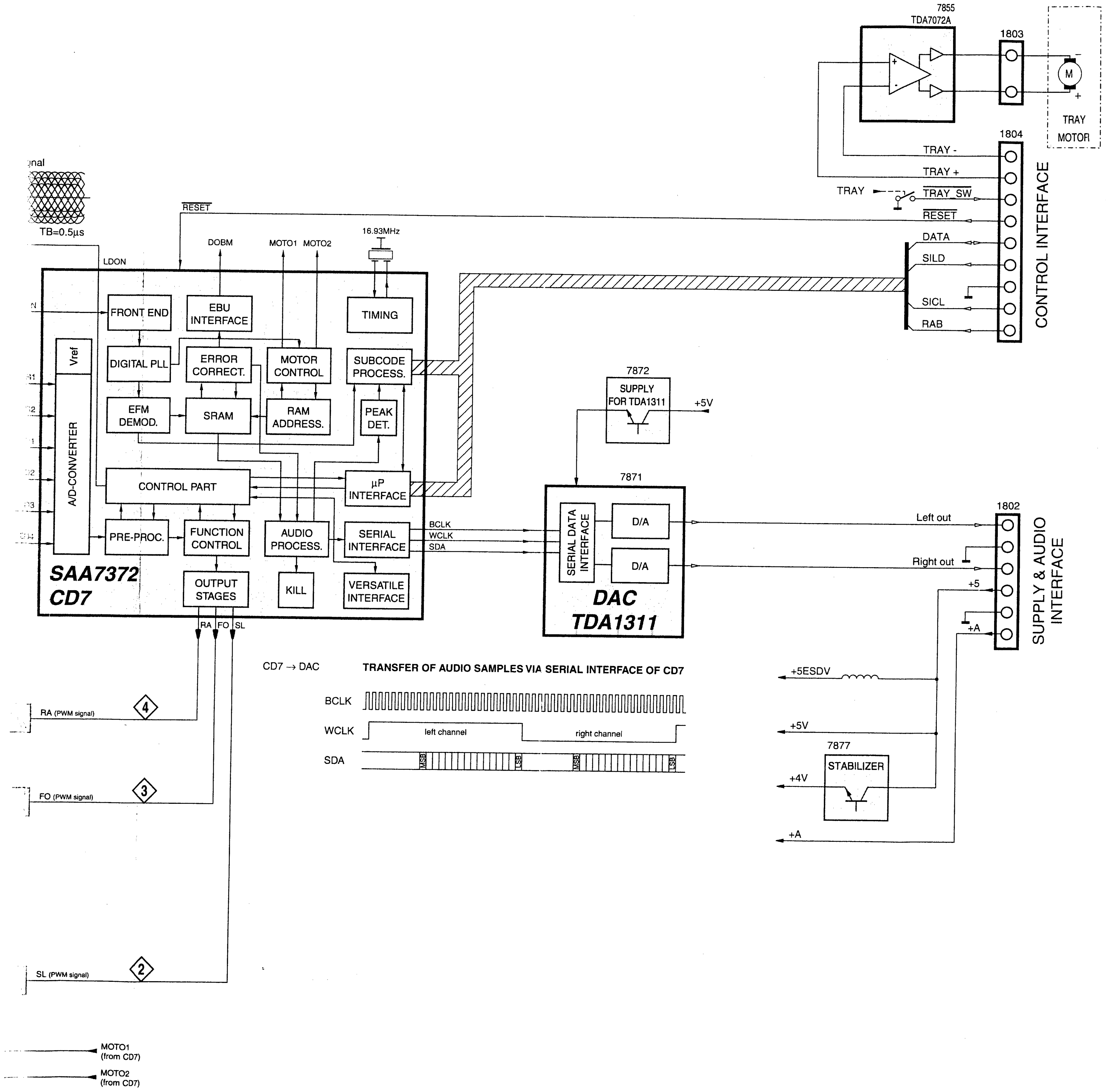


Fig. 2

Functional Diagram *ECO Short Loader with CD7*

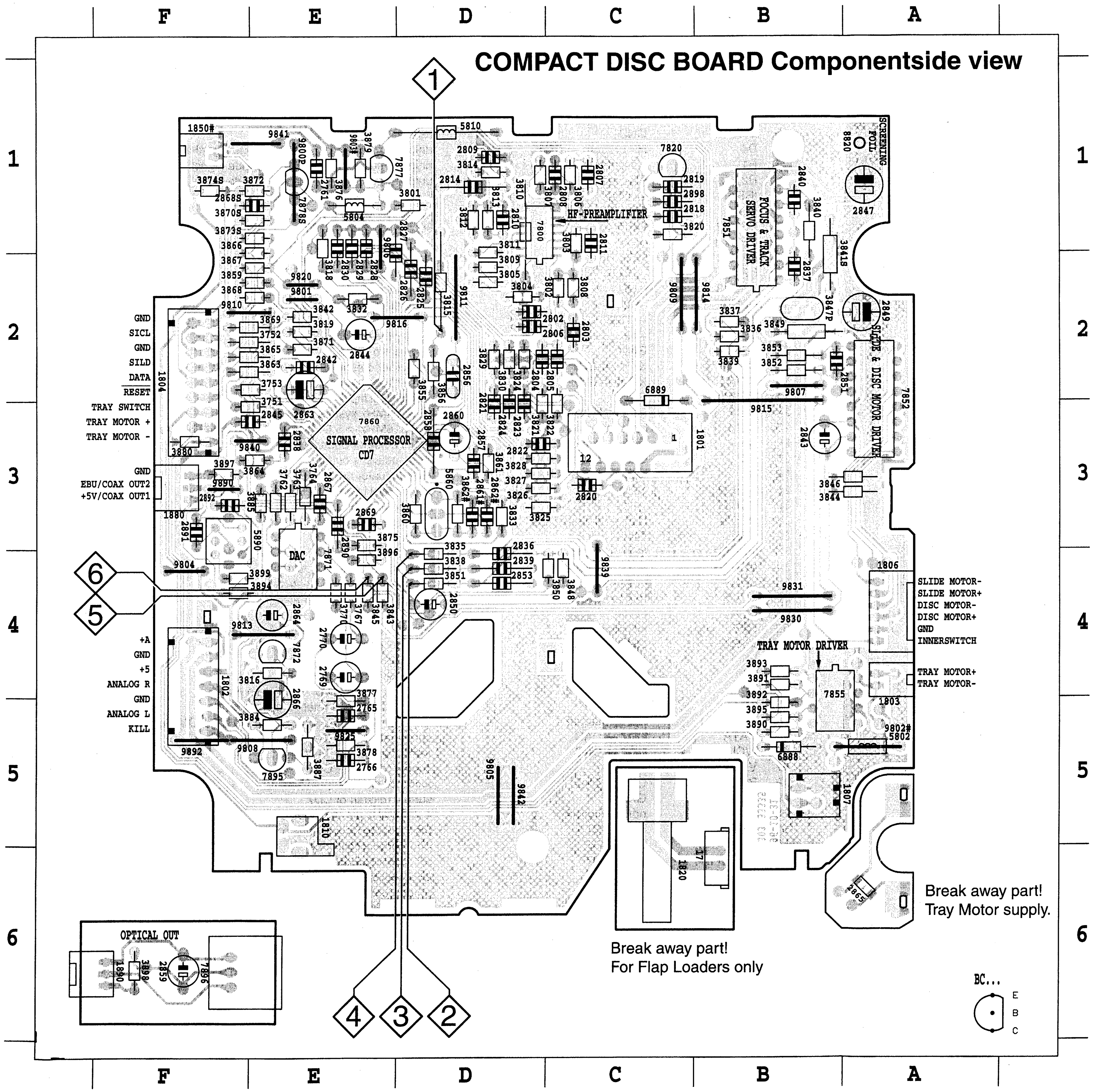

DISC
TURNTABLE MOTOR
TRACK SERVO
FOCUS SERVO
SLIDE SERVO
ALPC
Laser
turntable
inner switch
pick up unit
slide motor
PHOTO DIODE ARRAY
D1
D2
R1
R2
D3
FLEX PCB
CD - Drive
VAM1201
Laser on/off
Automatic Laser Power Control
+5V
HF-PREAMPLIFIER
1
HFIN
> 800 mVpp
eye-pattern signal
TB=0.5µs
LDON
RESET
DOBM
MOTO1
MOTO2
16.93MHz
R1
R2
D1
D2
D3
D4
L.P.F.
Vref
A/D-CONVERTER
FRONT END
EBU INTERFACE
TIMING
DIGITAL PLL
ERROR CORRECT.
MOTOR CONTROL
SUBCODE PROCESS.
EFM DEMOD.
SRAM
RAM ADDRESS.
PEAK DET.
CONTROL PART
µP INTERFACE
PRE-PROC.
FUNCTION CONTROL
AUDIO PROCESS.
SERIAL INTERFACE
OUTPUT STAGES
KILL
VERSATILE INTERFACE
SAA7372
CD7
RA
FO
SL
BCLK
WCLK
SDA
7855
TDA7072A
1803
M
TRAY MOTOR
1804
TRAY -
TRAY +
TRAY
TRAY_SW
RESET
DATA
SILD
SICL
RAB
CONTROL INTERFACE
7872
SUPPLY FOR TDA1311
+5V
7871
SERIAL DATA INTERFACE
D/A
D/A
DAC
TDA1311
1802
Left out
Right out
+5
+A
SUPPLY & AUDIO INTERFACE
7851
MOTOR DRIVER
TRACK Servo-
TRACK Servo+
FOCUS Servo-
FOCUS Servo+
TDA7073A
TRACK
RA (PWM signal)
4
FOCUS
FO (PWM signal)
3
6
2,5V
0
-2,5V
during focus search
TB=0.1s
7852
MOTOR DRIVER
SLIDE Motor-
SLIDE Motor+
DISC Motor-
DISC Motor+
TDA7073A
SLIDE
SL (PWM signal)
2
DISC MOTOR
MOTO1 (from CD7)
MOTO2 (from CD7)
CD7 → DAC
TRANSFER OF AUDIO SAMPLES VIA SERIAL INTERFACE OF CD7
BCLK
WCLK
left channel
right channel
SDA
MSB
LSB
MSB
LSB
+5ESDV
+5V
7877
STABILIZER
+4V
+A


7855
TDA7072A
1803
M
TRAY
MOTOR
1804
TRAY -
TRAY +
TRAY
TRAY_SW
RESET
DATA
SILD
SICL
RAB
CONTROL INTERFACE
nal
TB=0.5µs
RESET
LDON
DOBM
MOTO1
MOTO2
16.93MHz
FRONT END
EBU INTERFACE
TIMING
Vref
DIGITAL PLL
ERROR CORRECT.
MOTOR CONTROL
SUBCODE PROCESS.
EFM DEMOD.
SRAM
RAM ADDRESS.
PEAK DET.
A/D-CONVERTER
CONTROL PART
µP INTERFACE
PRE-PROC.
FUNCTION CONTROL
AUDIO PROCESS.
SERIAL INTERFACE
BCLK
WCLK
SDA
SAA7372
CD7
OUTPUT STAGES
KILL
VERSATILE INTERFACE
RA
FO
SL
7872
SUPPLY FOR TDA1311
+5V
7871
SERIAL DATA INTERFACE
D/A
D/A
DAC
TDA1311
1802
Left out
Right out
+5
+A
SUPPLY & AUDIO INTERFACE
CD7 → DAC
TRANSFER OF AUDIO SAMPLES VIA SERIAL INTERFACE OF CD7
BCLK
WCLK
left channel
right channel
SDA
MSB
LSB
MSB
LSB
+5ESDV
+5V
7877
STABILIZER
+4V
+A
RA (PWM signal)
4
FO (PWM signal)
3
SL (PWM signal)
2
MOTO1 (from CD7)
MOTO2 (from CD7)

Abbreviations CD Part

SAA7372 – DECODER AND DIGITAL SERVO IC CD7

Pin	*Name*	*Direction*	*Description*
1	VSSA1	GND	supply (analog) of CD7
2	VDDA1	+4V	supply (analog) of CD7
3	D1	HF-preamp → CD7	unipolar current input (central diode signal input)
4	D2	HF-preamp → CD7	unipolar current input (central diode signal input)
5	D3	HF-preamp → CD7	unipolar current input (central diode signal input)
6	VRL	GND	reference input for ADC
7	D4	HF-preamp → CD7	unipolar current input (central diode signal input)
8	R1	HF-preamp → CD7	unipolar current input (satellite diode signal input)
9	R2	HF-preamp → CD7	unipolar current input (satellite diode signal input)
10	IREFT	→ CD7	current reference for calibration ADC
11	VRH	not connected	reference output from ADC
12	VSSA2	GND	supply (analog) of CD7
13	SELPLL	+4V	selects whether internal clock multiplier PLL is used
14	ISLICE	CD7 →	current feedback from data slicer
15	HFIN	→ CD7	comparator signal input
16	VSSA3	GND	supply (analog) of CD7
17	HFREF	→ CD7	comparator common mode input
18	IREF	→ CD7	reference current pin (nom. VDD/2)
19	VDDA2	+4V	supply (analog) of CD7
20	TEST1	GND	test control input
21	CRIN	X-Tal → CD7	crystal/resonator input
22	CDOUT	X-Tal → CD7	crystal/resonator output
23	TEST2	GND	test control input
24	CL16	not connected	16.9344MHz system clock output
25	CL11	not connected	11.2896MHz or 5.6448MHz clock output (3-state)
26	RA	CD7 → servo driver	radial actuator output
27	FO	CD7 → servo driver	focus actuator output
28	SL	CD7 → servo driver	slide actuator output
29	TEST3	GND	test control input
30	VDD1P	+4V	supply (digital) of CD7
31	DOBM	CD7 → digital output	bi-phase mark output (3-state)
32	VSS1	GND	supply (digital) of CD7
33	MOTO1	CD7 → servo driver	motor output1 of CD7; versatile (3-state)
34	MOTO2	CD7 → servo driver	motor output2 of CD7; versatile (3-state)
35	SBSY	not connected	subcode block sync (3-state)
36	SFSY	not connected	subcode frame sync (3-state)
37	RCK	GND	subcode clock input
38	SUB	not connected	P to W subcode bits (3-state)
39	VSS2	GND	supply (digital) of CD7
40	V5	not connected	versatile output pin of CD7
41	V4	not connected	versatile output pin of CD7
42	V3	not connected	versatile output pin of CD7 (open drain)
43	KILL	CD7 →	kill output; programmable (open drain)
44	MISC	not connected	C2 error flag; output only defined in CD-ROM modes (3-state)
45	DATA	CD7 → DAC	serial data output (3-state)
46	WCLK	CD7 → DAC	word clock output (3-state)
47	VDD2P	+4V	supply (digital) of CD7
48	BCLK	CD7 → DAC	serial bit clock output (3-state)
49	VSS3	GND	supply (digital) of CD7
50	CL4	not connected	4.2336MHz µP clock output
51	SDA	µP → CD7	µP interface data I/O line (open drain output)
52	SCL	µP → CD7	µP interface clock line
53	RAB	µP → CD7	µP interface R/W and load control line
54	SILD	µP → CD7	µP interface R/W and load control line
55	NC		no connection
56	VSS4	GND	supply (digital) of CD7
57	RESET	µP → CD7	power-on reset input (active low)
58	STATUS	not connected	servo interrupt request line/CD7 status register output (open drain)
59	VDD3C	+4V	supply core (digital)
60	C2FAIL	not connected	indication of correction failure (open drain)
61	CFLG	not connected	correction flag output (open drain)
62	V1	→ CD7	versatile input pin
63	V2	→ CD7	versatile input pin
64	LDON	CD7 → 7820	laser drive on output (open drain)



COMPACT DISC BOARD Componentside view

F
E
D
C
B
A
1
2
3
4
5
6
SIGNAL PROCESSOR CD7
7860
HF-PREAMPLIFIER
7800
FOCUS & TRACK SERVO DRIVER
7851
SLIDE & DISC MOTOR DRIVER
7852
TRAY MOTOR DRIVER
7855
DAC
7871
SCREENING FOIL
OPTICAL OUT
1801
1802
1803
1804
1806
1807
1810
1820
1850#
1880
1890
GND
SICL
GND
SILD
DATA
RESET
TRAY SWITCH
TRAY MOTOR +
TRAY MOTOR -
GND
EBU/COAX OUT2
+5V/COAX OUT1
+A
GND
+5
ANALOG R
GND
ANALOG L
KILL
SLIDE MOTOR-
SLIDE MOTOR+
DISC MOTOR-
DISC MOTOR+
GND
INNERSWITCH
TRAY MOTOR+
TRAY MOTOR-
BC...
E
B
C

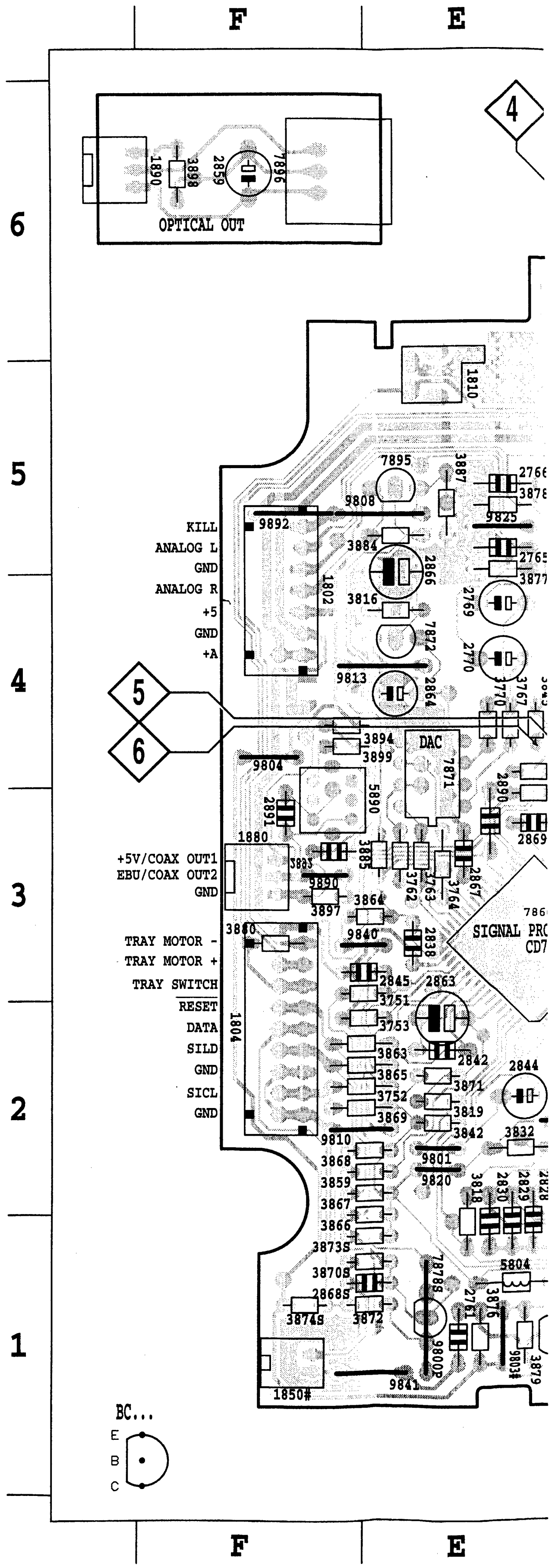
Break away part!
For Flap Loaders only

Break away part!
Tray Motor supply.

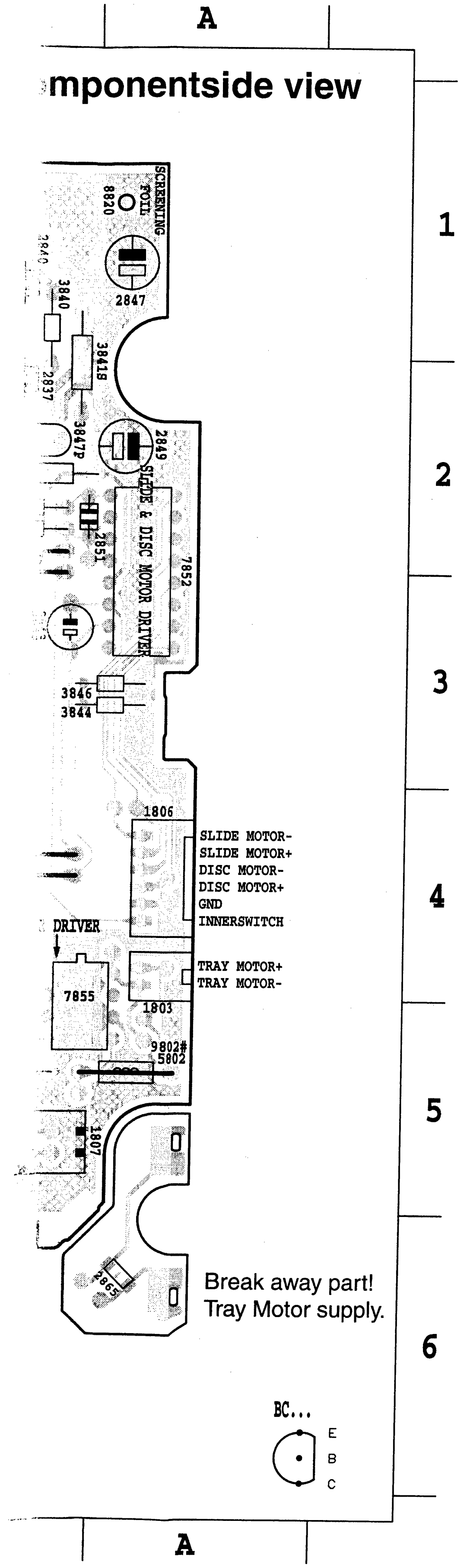
17	B6	3751	F3	3873S	E1
1801	C3	3752	F2	3874S	F1
1802	F4	3753	F2	3875	E3
1803	A4	3762	E3	3876	E1
1804	F2	3763	E3	3877	E5
1806	A4	3764	E3	3878	E5
1807	B5	3767	E4	3879	E1
1810	E5	3770	E4	3880	F3
1820	C5	3801	D1	3884	E5
1850#	F1	3802	C2	3885	E3
1880	F3	3803	C1	3887	E5
1890	F6	3804	D2	3888	F6
2761	E1	3805	D2	3890	B5
2765	E5	3806	C1	3891	B4
2766	E5	3807	D1	3892	B5
2769	E4	3808	C2	3893	B4
2770	E4	3809	D2	3894	F4
2802	D2	3810	D1	3895	B5
2803	C2	3811	D1	3896	E4
2804	D2	3812	D1	3897	F3
2805	C2	3813	D1	3898	F6
2806	D2	3814	D1	3899	F4
2807	C1	3815	D2	5802	A5
2808	C1	3816	E4	5804	E1
2809	D1	3818	E1	5810	D1
2810	D1	3819	E2	5860	D3
2811	C1	3820	C1	5890	F3
2814	D1	3821	D3	6888	B5
2818	C1	3822	C3	6889	C2
2819	C1	3824	D2	7800	D1
2820	C3	3825	D3	7820	C1
2821	D3	3826	D3	7851	B1
2822	D3	3827	D3	7852	A2
2823	D3	3828	D3	7855	B5
2824	D3	3829	D2	7860	E3
2825	D2	3830	D2	7871	E4
2826	D2	3832	E2	7872	E4
2827	E1	3833	D3	7877	E1
2828	E1	3835	D4	7878S	E1
2829	E1	3836	B2	7895	E5
2830	E1	3837	B2	7896	F6
2836	D4	3838	D4	9800P	E1
2837	B2	3839	B2	9801	E2
2838	E3	3840	B1	9803#	E1
2839	D4	3842	E2	9804	F4
2840	B1	3841S	B2	9805	D5
2842	E2	3843	E4	9806	E1
2843	B3	3844	A3	9802#	A5
2844	E2	3845	E4	9807	B2
2845	F3	3846	A3	9808	E5
2847	A1	3848	C4	9809	C2
2849	A2	3847P	B2	9810	F2
2850	D4	3849	B2	9811	D2
2851	B2	3850	C4	9813	E4
2853	D4	3851	D4	9814	B2
2856	D2	3852	B2	9815	B2
2857	D3	3853	B2	9816	E2
2858	D3	3855	D2	9820	E2
2859	F6	3856	D2	9825	E5
2860	D3	3859	E2	9830	B4
2863	E2	3860	D3	9831	B4
2861#	D3	3861	D3	9839	C4
2864	E4	3863	F2	9840	F3
2865	A6	3864	E3	9841	E1
2862#	D3	3862#	D3	9842	D5
2866	E5	3865	F2	9890	F3
2867	E3	3866	E1	9892	F5
2868S	E1	3867	E2		
2869	E3	3868	E2		
2890	E3	3869	F2		
2891	F3	3870S	E1		
2892	F3	3871	E2		
2898	C1	3872	E1		

S = for Systems
P = for Portables
# = provisional

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partslist.



F
E
6
5
4
3
2
1
OPTICAL OUT
KILL
ANALOG L
GND
ANALOG R
+5
GND
+A
+5V/COAX OUT1
EBU/COAX OUT2
GND
TRAY MOTOR -
TRAY MOTOR +
TRAY SWITCH
RESET
DATA
SILD
GND
SICL
GND
DAC
BC...
E
B
C


mponentside view

A
1
2
3
4
5
6
A
SCREENING FOIL
8820
2847
3840
3841S
2837
3847P
2849
SLIDE & DISC MOTOR DRIVER
7852
2851
3846
3844
1806
SLIDE MOTOR-
SLIDE MOTOR+
DISC MOTOR-
DISC MOTOR+
GND
INNERSWITCH
DRIVER
TRAY MOTOR+
TRAY MOTOR-
7855
1803
9802#
5802
1807
2865
Break away part!
Tray Motor supply.
BC...
E
B
C

17	B6	3751	F3	3873S	E1
1801	C3	3752	F2	3874S	F1
1802	F4	3753	F2	3875	E3
1803	A4	3762	E3	3876	E1
1804	F2	3763	E3	3877	E5
1806	A4	3764	E3	3878	E5
1807	B5	3767	E4	3879	E1
1810	E5	3770	E4	3880	F3
1820	C5	3801	D1	3884	E5
1850#	F1	3802	C2	3885	E3
1880	F3	3803	C1	3887	E5
1890	F6	3804	D2	3888	F6
2761	E1	3805	D2	3890	B5
2765	E5	3806	C1	3891	B4
2766	E5	3807	D1	3892	B5
2769	E4	3808	C2	3893	B4
2770	E4	3809	D2	3894	F4
2802	D2	3810	D1	3895	B5
2803	C2	3811	D1	3896	E4
2804	D2	3812	D1	3897	F3
2805	C2	3813	D1	3898	F6
2806	D2	3814	D1	3899	F4
2807	C1	3815	D2	5802	A5
2808	C1	3816	E4	5804	E1
2809	D1	3818	E1	5810	D1
2810	D1	3819	E2	5860	D3
2811	C1	3820	C1	5890	F3
2814	D1	3821	D3	6888	B5
2818	C1	3822	C3	6889	C2
2819	C1	3824	D2	7800	D1
2820	C3	3825	D3	7820	C1
2821	D3	3826	D3	7851	B1
2822	D3	3827	D3	7852	A2
2823	D3	3828	D3	7855	B5
2824	D3	3829	D2	7860	E3
2825	D2	3830	D2	7871	E4
2826	D2	3832	E2	7872	E4
2827	E1	3833	D3	7877	E1
2828	E1	3835	D4	7878S	E1
2829	E1	3836	B2	7895	E5
2830	E1	3837	B2	7896	F6
2836	D4	3838	D4	9800P	E1
2837	B2	3839	B2	9801	E2
2838	E3	3840	B1	9803#	E1
2839	D4	3842	E2	9804	F4
2840	B1	3841S	B2	9805	D5
2842	E2	3843	E4	9806	E1
2843	B3	3844	A3	9802#	A5
2844	E2	3845	E4	9807	B2
2845	F3	3846	A3	9808	E5
2847	A1	3848	C4	9809	C2
2849	A2	3847P	B2	9810	F2
2850	D4	3849	B2	9811	D2
2851	B2	3850	C4	9813	E4
2853	D4	3851	D4	9814	B2
2856	D2	3852	B2	9815	B2
2857	D3	3853	B2	9816	E2
2858	D3	3855	D2	9820	E2
2859	F6	3856	D2	9825	E5
2860	D3	3859	E2	9830	B4
2863	E2	3860	D3	9831	B4
2861#	D3	3861	D3	9839	C4
2864	E4	3863	F2	9840	F3
2865	A6	3864	E3	9841	E1
2862#	D3	3862#	D3	9842	D5
2866	E5	3865	F2	9890	F3
2867	E3	3866	E1	9892	F5
2868S	E1	3867	E2		
2869	E3	3868	E2		
2890	E3	3869	F2		
2891	F3	3870S	E1		
2892	F3	3871	E2		
2898	C1	3872	E1		

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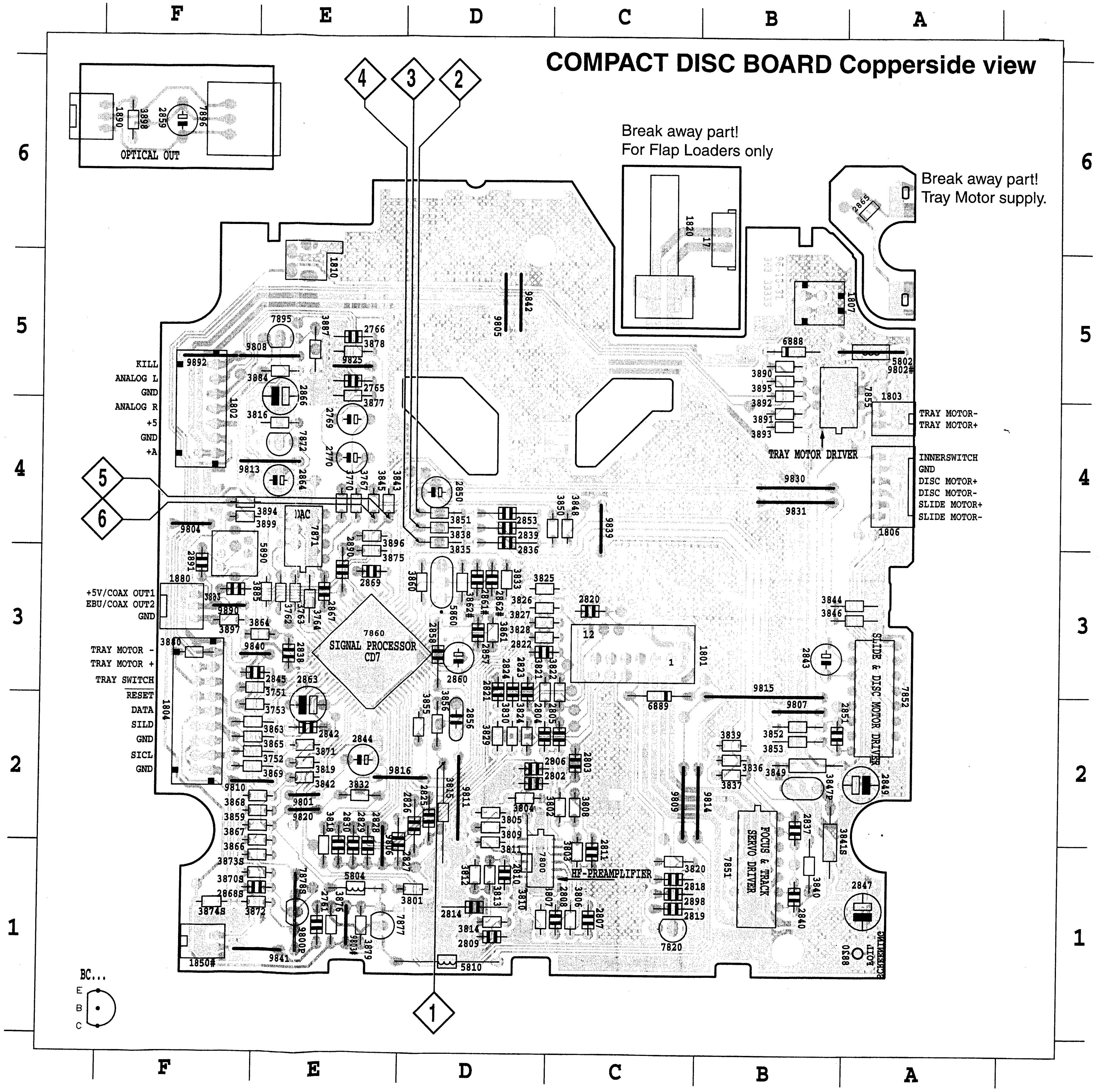
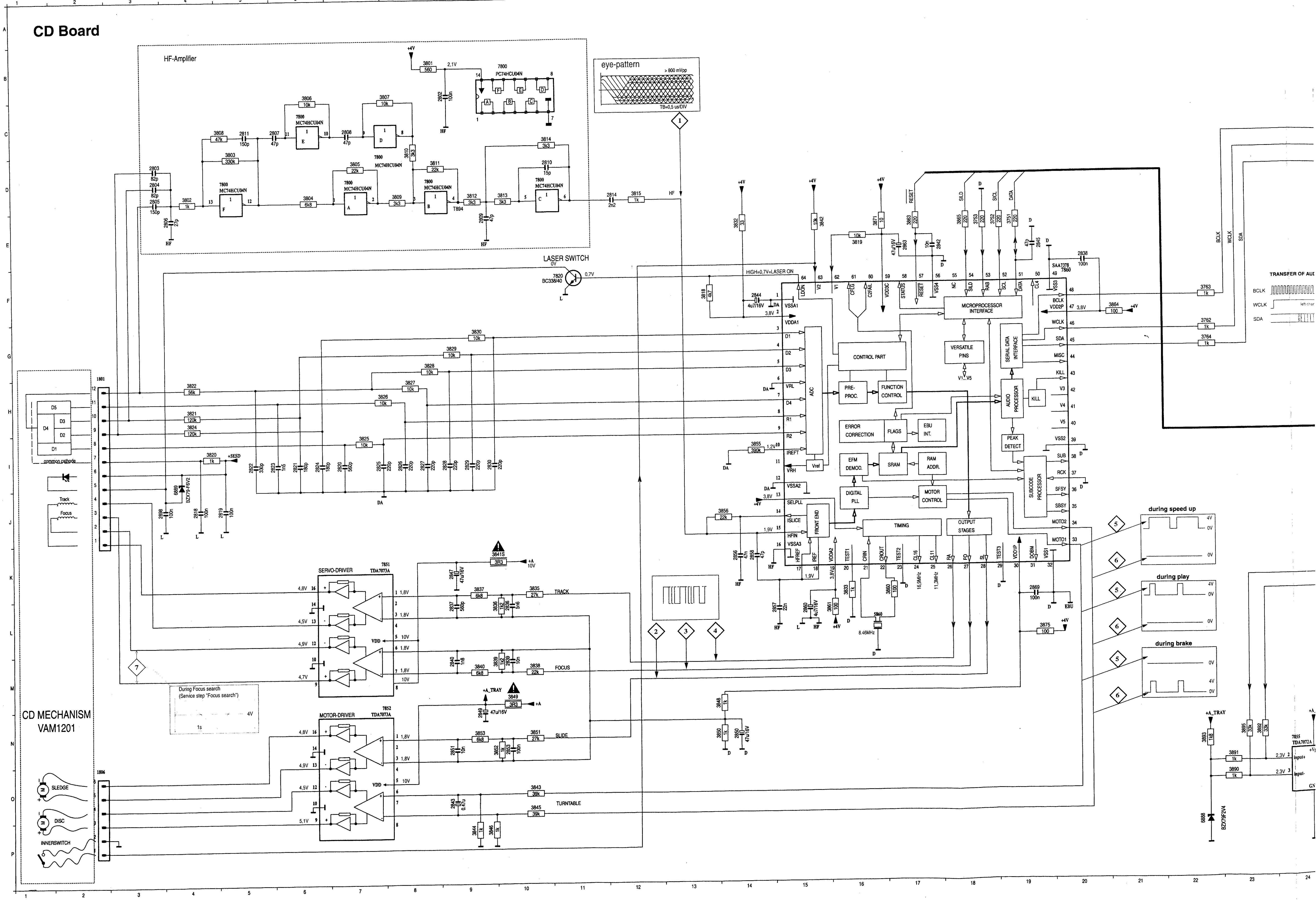
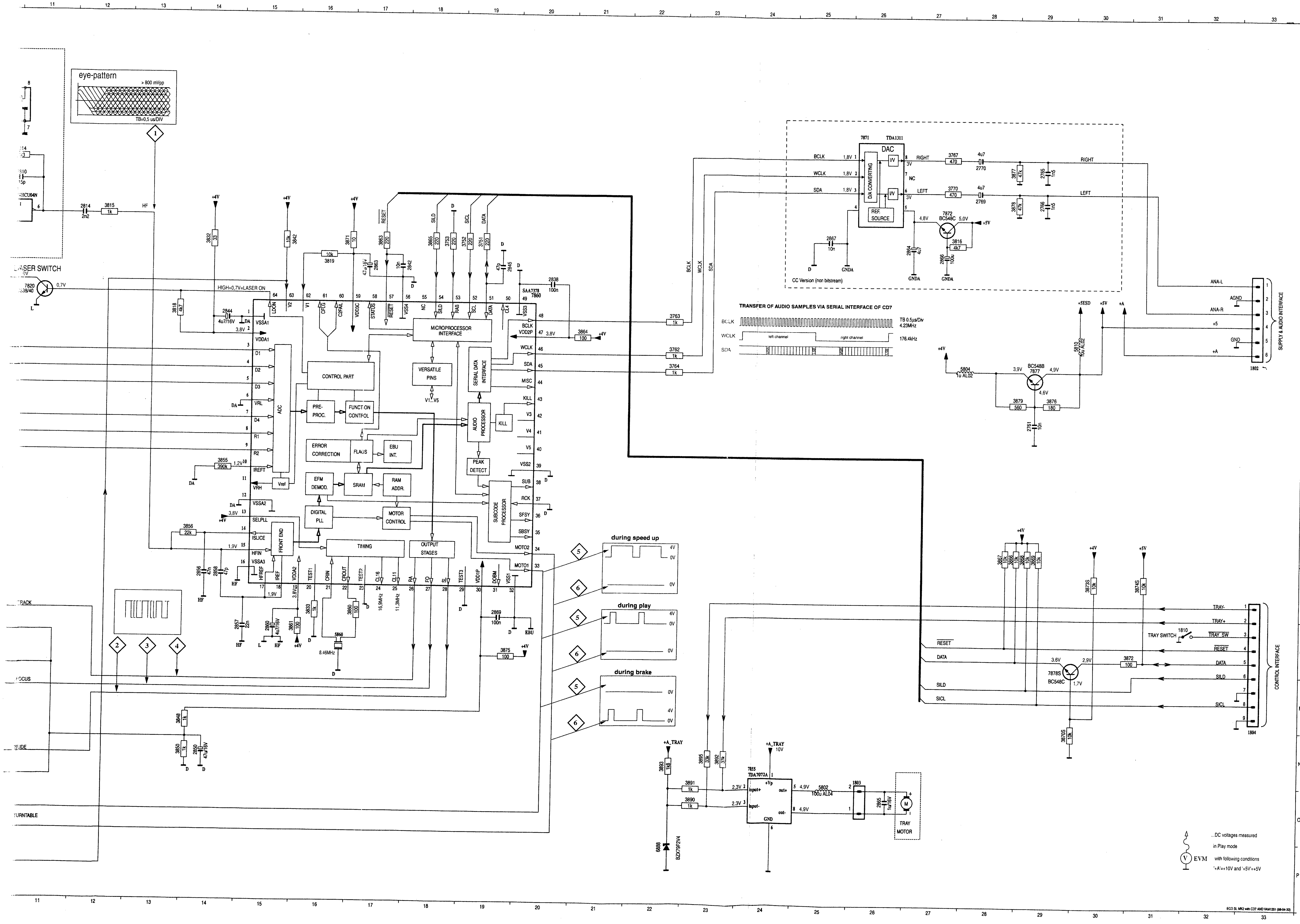
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partslist.


COMPACT DISC BOARD Copperside view

F
E
D
C
B
A
6
5
4
3
2
1
4
3
2
1
5
6
1890
2859
7896
OPTICAL OUT
Break away part!
For Flap Loaders only
1820
17
Break away part!
Tray Motor supply.
2865
1810
1807
9842
9805
7895
3887
2766
3878
9808
9825
9892
KILL
ANALOG L
GND
ANALOG R
+5
GND
+A
1802
3884
2866
2765
3877
3816
2769
7872
2770
9813
2864
3767
3770
3845
3843
2850
6888
3890
3895
3892
3891
3893
7855
1803
5802
9802#
TRAY MOTOR-
TRAY MOTOR+
TRAY MOTOR DRIVER
INNERSWITCH
GND
DISC MOTOR+
DISC MOTOR-
SLIDE MOTOR+
SLIDE MOTOR-
1806
9830
9831
3894
3899
DAC
7871
9804
2891
5890
3896
3875
3851
3838
3835
2853
2839
2836
3850
3848
9839
1880
+5V/COAX OUT1
EBU/COAX OUT2
GND
3880
3885
9890
3897
3864
3762
3763
3764
2867
2869
3860
5860
3862#
2861#
3833
3825
3826
3827
3828
3861
2822
2820
7860
SIGNAL PROCESSOR
CD7
2858
2857
2860
12
1
1801
2843
3844
3846
TRAY MOTOR -
TRAY MOTOR +
TRAY SWITCH
RESET
DATA
SILD
GND
SICL
GND
1804
9840
2838
2845
2863
3751
3753
3863
3865
3752
3869
2842
3871
3819
3842
2844
3832
9816
3855
3856
2856
3829
2821
2824
2823
3830
3821
2804
2805
6889
9815
9807
2851
7852
SLIDE & DISC MOTOR DRIVER
3839
3852
3853
3836
3849
3837
3847P
2849
9810
3868
3859
3867
3866
3873S
3870S
2868S
3874S
3872
9801
9820
3818
2830
2829
2828
9806
2827
2826
2825
3835
9811
2806
2802
2803
3804
3805
3809
3811
3802
3808
3803
2811
3810
7800
9809
9814
7851
FOCUS & TRACK SERVO DRIVER
2837
3841S
3840
2840
2847
3820
2818
2898
2819
HF-PREAMPLIFIER
2810
2807
2808
3806
3807
3812
3813
3815
5804
2761
3876
3801
7877
3879
9803#
9800P
7878S
2814
3814
2809
5810
7820
9841
1850#
8820
SCREENING FOIL
BC...
E
B
C
F
E
D
C
B
A

CD Board


HF-Amplifier
7800
PC74HCU04N
7800
MC74HCU04N
3801
560
2,1V
+4V
eye-pattern
> 800 mVpp
TB=0,5 us/DIV
LASER SWITCH
0V
7820
BC338/40
0,7V
HIGH=0,7V=LASER ON
SAA7378
7860
MICROPROCESSOR INTERFACE
VERSATILE PINS
SERIAL DATA INTERFACE
CONTROL PART
ADC
PRE-PROC.
FUNCTION CONTROL
ERROR CORRECTION
FLAGS
EBU INT.
EFM DEMOD.
SRAM
RAM ADDR.
DIGITAL PLL
MOTOR CONTROL
FRONT END
TIMING
OUTPUT STAGES
AUDIO PROCESSOR
KILL
PEAK DETECT
SUBCODE PROCESSOR
Vref
during speed up
during play
during brake
4V
0V
TRANSFER OF AU
BCLK
WCLK
SDA
SERVO-DRIVER
7851
TDA7073A
MOTOR-DRIVER
7852
TDA7073A
TRACK
FOCUS
SLIDE
TURNTABLE
During Focus search
(Service step "Focus search")
4V
1s
CD MECHANISM
VAM1201
1801
1806
common cathode
Track
Focus
SLEDGE
DISC
INNERSWITCH
D1
D2
D3
D4
D5
5860
8.46MHz
+A_TRAY
7855
TDA7072A
6888
BZX79F2V4
6899
BZX79-F6V2
+5ESD
1
2
3
4
5
6
7


eye-pattern
> 800 mVpp
TB=0,5 us/DIV
LASER SWITCH
HIGH=0,7V=LASER ON
SAA7378
7860
MICROPROCESSOR INTERFACE
CONTROL PART
VERSATILE PINS
SERIAL DATA INTERFACE
PRE-PROC.
FUNCTION CONTROL
AUDIO PROCESSOR
KILL
ERROR CORRECTION
FLAGS
EBU INT.
PEAK DETECT
EFM DEMOD.
SRAM
RAM ADDR.
SUBCODE PROCESSOR
DIGITAL PLL
MOTOR CONTROL
FRONT END
TIMING
OUTPUT STAGES
ADC
Vref
8.46MHz
16,9MHz
11,3MHz
during speed up
during play
during brake
TRACK
FOCUS
SLIDE
TURNTABLE
7871 TDA1311
DAC
D/A CONVERTING
REF. SOURCE
RIGHT
LEFT
CC Version (non bitstream)
BCLK
WCLK
SDA
TRANSFER OF AUDIO SAMPLES VIA SERIAL INTERFACE OF CD7
TB 0.5µs/Div
4.23MHz
176.4kHz
left channel
right channel
ANA-L
AGND
ANA-R
+5
GND
+A
SUPPLY & AUDIO INTERFACE
1802
+5ESD
+5V
+A
BC548B 7877
TRAY-
TRAY+
TRAY SWITCH
TRAY_SW
RESET
DATA
SILD
SICL
CONTROL INTERFACE
1804
7878S BC548C
7855 TDA7072A
+A_TRAY
input+
input-
out+
out-
GND
1803
TRAY MOTOR
BZX79F2V4
6888
...DC voltages measured in Play mode
EVM with following conditions '+A'=+10V and '+5V'=+5V
ECO SL MK2 with CD7 AND VAM1201 (98-04-30)

1801	G2	3846	P9
1802	G33	3848	M13
1803	N26	3849	M10
1804	M33	3850	N13
1806	O2	3851	N10
1810	L31	3852	N9
2761	H29	3853	N9
2765	D29	3855	I14
2766	D29	3856	J14
2769	D28	3859	E16
2770	C28	3860	K17
2802	B9	3861	L15
2803	D3	3863	E17
2804	D3	3864	F21
2805	D3	3865	E18
2806	E4	3866	J28
2807	C6	3867	J28
2808	C7	3868	J29
2820	I 7	3869	J29
2821	I 6	3870S	N29
2822	I 5	3871	E16
2823	I 6	3872	L31
2824	I 6	3873S	K30
2825	I 7	3874S	K30
2826	I 8	3875	L19
2827	I 8	3876	H29
2828	I 9	3877	D28
2829	I 9	3878	D29
2830	I 9	3879	H28
2836	L10	3880	K33
2837	L9	3884	D31
2838	E20	3885	D31
2839	M10	3887	E32
2840	M9	3890	O23
2842	E17	3891	O23
2843	O9	3892	N23
2844	F14	3893	N22
2845	E19	3895	N23
2847	K9	5802	N25
2849	M9	5804	G28
2850	N14	5810	G30
2851	N9	5860	L16
2853	N10	6888	P22
2856	K14	6889	I 4
2857	L15	7800	C6
2858	K14	7800	D5
2860	L15	7800	D7
2863	E17	7800	D7
2864	E27	7800	D8
2865	O26	7800	D10
2866	E27	7820	F11
2867	E25	7851	K8
2868S	N30	7852	M8
2869	K19	7855	N24
2898	J3	7860	F15
3751	E19	7871	C26
3752	E18	7872	D27
3753	E18	7877	G29
3762	G22	7878S	L30
3763	F22	7895	D32
3764	G22	9801	D15
3767	C27	9892	E33
3770	D27		
3801	B8		
3802	D4		
3803	C5		
3804	D6		
3805	D7		
3806	B6		
3807	B8		
3808	C5		
3809	D8		
3810	C8		
3811	D8		
3812	D9		
3813	D10		
3814	C10		
3815	D12		
3816	E27		
3818	F13		
3819	D15		
3820	I 4		
3821	H4		
3822	H4		
3824	H4		
3825	I 7		
3826	H7		
3827	H8		
3828	G8		
3829	G9		
3830	G9		
3832	E14		
3833	K16		
3835	K10		
3836	L9		
3837	K9		
3838	M10		
3839	M9		
3840	M9		
3841S	K10		
3842	E15		
3843	O10		
3844	P9		
3845	O10		

WARNING

CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CDM-ELECTRONICS WHEN CONNECTING A NEW CDM MECHANISM. THAT´S WHY, BESIDES THE SAFETY MEASURES LIKE

- ***SWITCH OFF POWER SUPPLY***
- ***ESD PROTECTION***

ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

The following steps have to be done when replacing the CDM mechanism:

1. Disconnect old CDM flexfoil from printed board
2. Connect paperclip to CDM flexfoil to short-circuit flexfoil (fig.1)
3. Short-circuit printed board with **brass-sheet (4822 321 11197)** plugged into the flexfoil connector (fig.2)
4. Remove old CDM mechanism
5. Position new CDM mechanism in its studs
6. Remove short-circuit from printed board connector
7. Remove short-circuit from flexfoil of new CDM
8. Connect new flexfoil to print connector (fig.3)

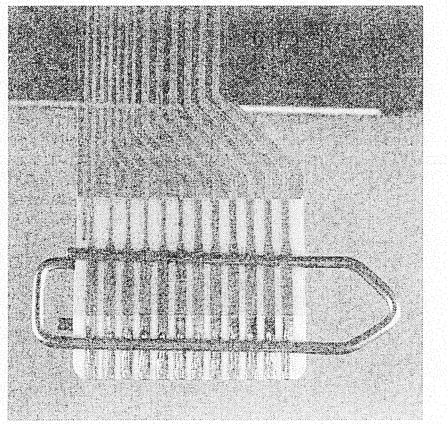


fig.1

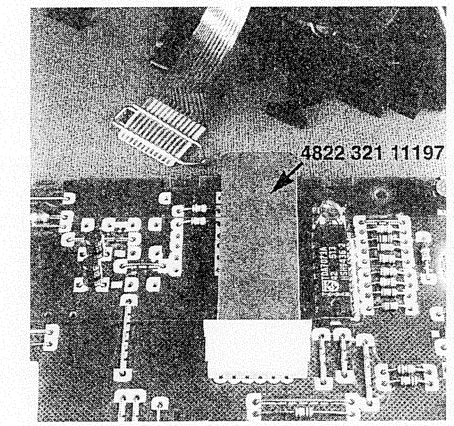

4822 321 11197

fig.2

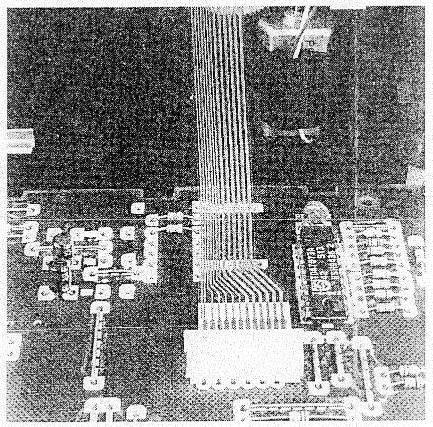
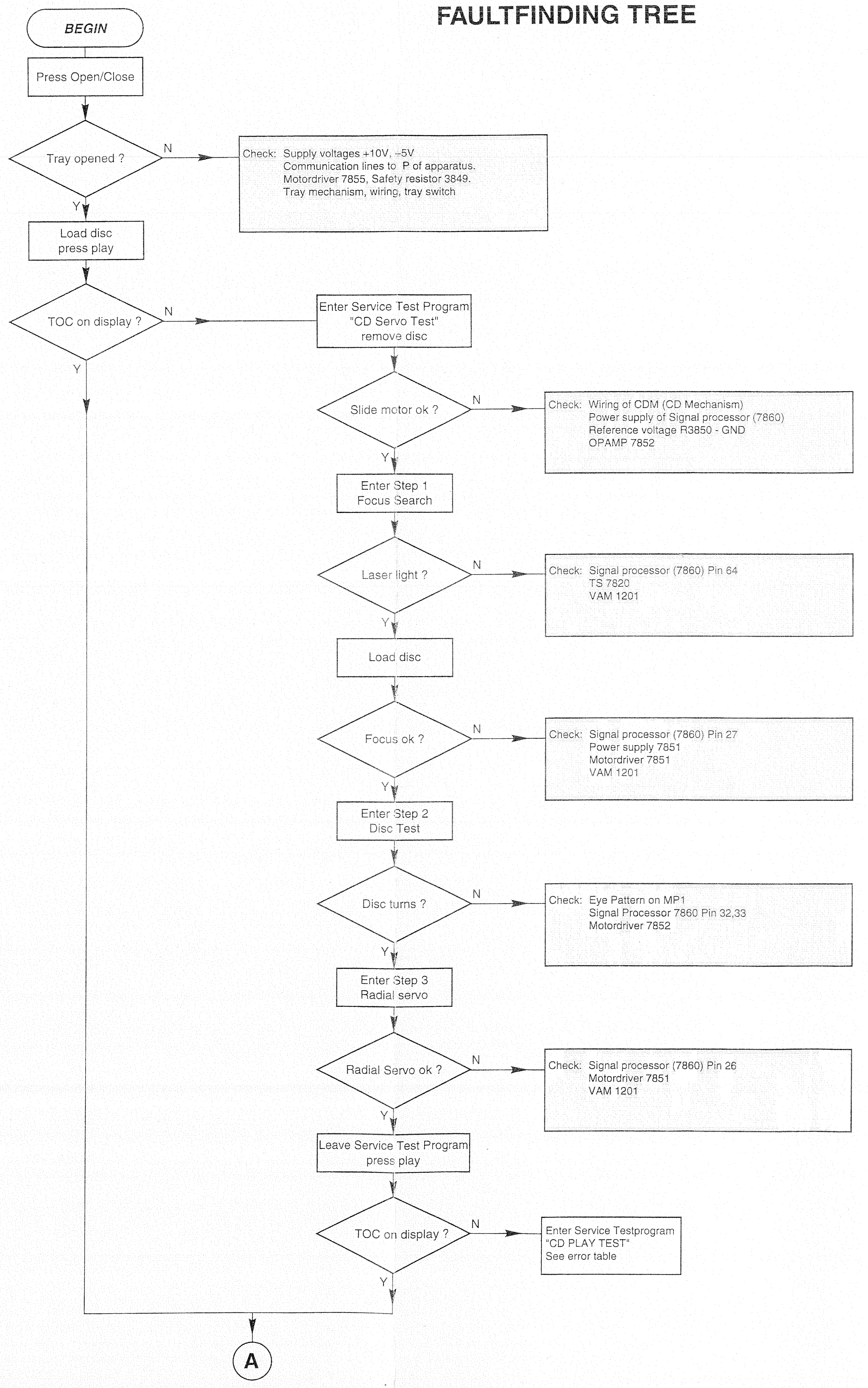
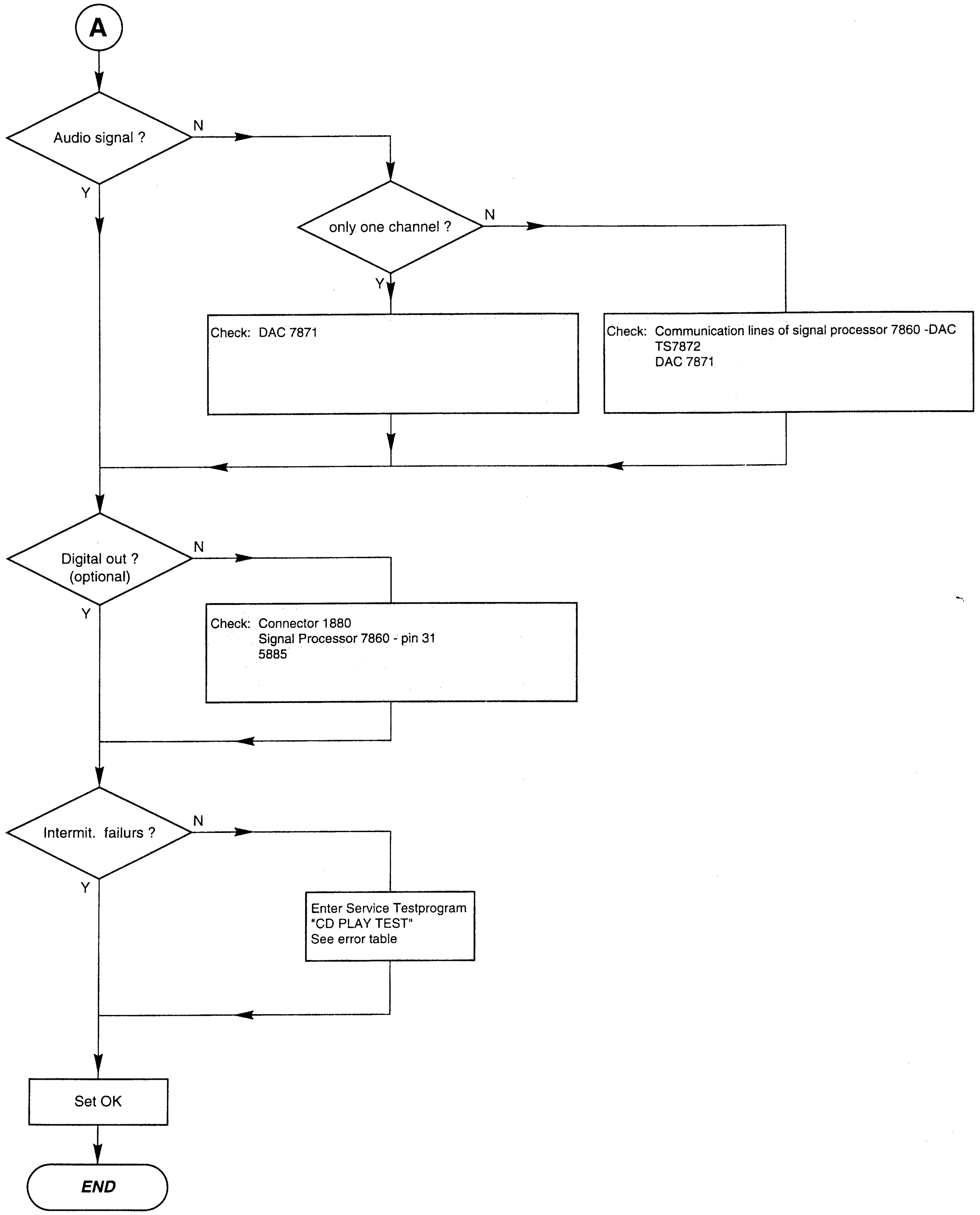


fig.3

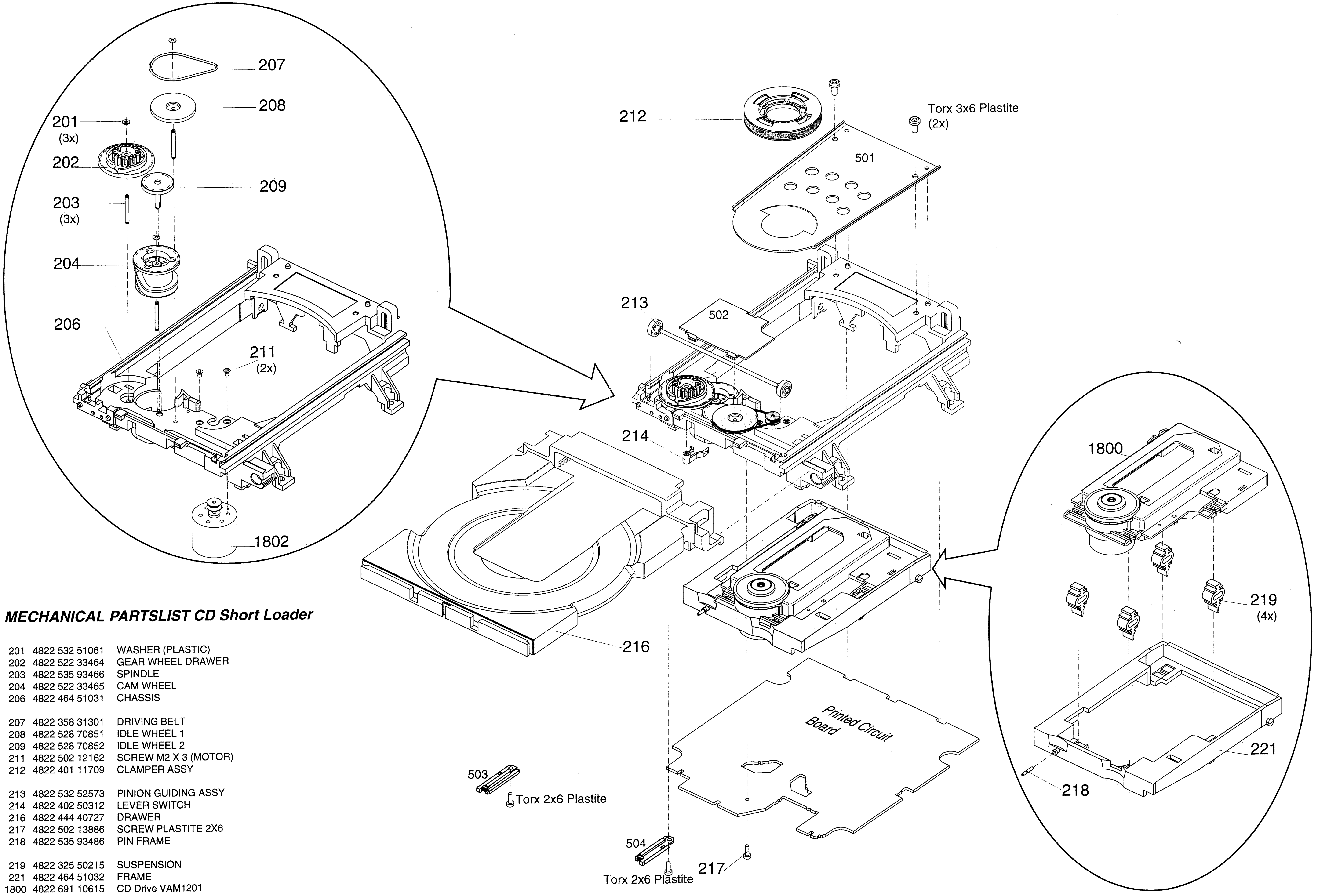
Remarks

FAULTFINDING TREE


BEGIN
Press Open/Close
Tray opened ?
N
Check: Supply voltages +10V, –5V
Communication lines to P of apparatus.
Motordriver 7855, Safety resistor 3849.
Tray mechanism, wiring, tray switch
Y
Load disc
press play
TOC on display ?
N
Enter Service Test Program
"CD Servo Test"
remove disc
Y
Slide motor ok ?
N
Check: Wiring of CDM (CD Mechanism)
Power supply of Signal processor (7860)
Reference voltage R3850 - GND
OPAMP 7852
Y
Enter Step 1
Focus Search
Laser light ?
N
Check: Signal processor (7860) Pin 64
TS 7820
VAM 1201
Y
Load disc
Focus ok ?
N
Check: Signal processor (7860) Pin 27
Power supply 7851
Motordriver 7851
VAM 1201
Y
Enter Step 2
Disc Test
Disc turns ?
N
Check: Eye Pattern on MP1
Signal Processor 7860 Pin 32,33
Motordriver 7852
Y
Enter Step 3
Radial servo
Radial Servo ok ?
N
Check: Signal processor (7860) Pin 26
Motordriver 7851
VAM 1201
Y
Leave Service Test Program
press play
TOC on display ?
N
Enter Service Testprogram
"CD PLAY TEST"
See error table
Y
A


A
Audio signal ?
N
Y
only one channel ?
N
Y
Check: DAC 7871
Check: Communication lines of signal processor 7860 -DAC
TS7872
DAC 7871
Digital out ?
(optional)
N
Y
Check: Connector 1880
Signal Processor 7860 - pin 31
5885
Intermit. failurs ?
N
Y
Enter Service Testprogram
"CD PLAY TEST"
See error table
Set OK
END

Exploded view CD Short Loader


207
208
201
(3x)
202
209
203
(3x)
204
206
211
(2x)
1802
212
Torx 3x6 Plastite
(2x)
501
213
502
214
1800
216
219
(4x)
Printed Circuit Board
221
218
503
Torx 2x6 Plastite
504
Torx 2x6 Plastite
217

MECHANICAL PARTSLIST CD Short Loader

201	4822 532 51061	WASHER (PLASTIC)
202	4822 522 33464	GEAR WHEEL DRAWER
203	4822 535 93466	SPINDLE
204	4822 522 33465	CAM WHEEL
206	4822 464 51031	CHASSIS
207	4822 358 31301	DRIVING BELT
208	4822 528 70851	IDLE WHEEL 1
209	4822 528 70852	IDLE WHEEL 2
211	4822 502 12162	SCREW M2 X 3 (MOTOR)
212	4822 401 11709	CLAMPER ASSY
213	4822 532 52573	PINION GUIDING ASSY
214	4822 402 50312	LEVER SWITCH
216	4822 444 40727	DRAWER
217	4822 502 13886	SCREW PLASTITE 2X6
218	4822 535 93486	PIN FRAME
219	4822 325 50215	SUSPENSION
221	4822 464 51032	FRAME
1800	4822 691 10615	CD Drive VAM1201
1802	4822 361 21708	MOTOR ASSY
	4822 502 30735	SCREW 3 X 6 PLASTITE

CS 53 088

MISCELLANEOUS

1801	4822 267 51453	FLEX FOIL CONNECTOR 12PIN
1804	5322 265 40945	CONNECTOR 9PIN
1810	4822 276 13503	TRAY SWITCH

CAPACITORS

2761	4822 121 51387	10nF	20%	16V
2765	4822 126 12878	1,5nF	10%	16V
2766	4822 126 12878	1,5nF	10%	16V
2769	4822 124 41969	1µF	20%	50V
2770	4822 124 23401	4,7µF	20%	25V
2802	4822 126 12882	100nF	20%	50V
2803	4822 122 10319	82pF	5%	50V
2804	4822 122 10319	82pF	5%	50V
2805	4822 122 33849	150pF	10%	50V
2806	4822 122 33192	27pF	5%	50V
2807	4822 122 33848	47pF	5%	50V
2808	4822 122 33848	47pF	5%	50V
2809	4822 122 33848	47pF	5%	50V
2810	4822 122 10462	15pF	5%	50V
2811	4822 122 33849	150pF	10%	50V
2814	4822 126 12339	2,2nF	10%	16V
2818	4822 126 12882	100nF	20%	50V
2819	4822 126 12882	100nF	20%	50V
2820	4822 122 10459	560pF	10%	50V
2821	4822 126 10053	180pF	10%	50V
2822	4822 126 12787	330pF	10%	50V
2823	4822 126 12878	1,5nF	10%	16V
2824	4822 126 10053	180pF	10%	50V
2825	4822 122 10466	220pF	10%	50V
2826	4822 122 10466	220pF	10%	50V
2827	4822 122 10466	220pF	10%	50V
2828	4822 122 10466	220pF	10%	50V
2829	4822 122 10466	220pF	10%	50V
2830	4822 122 10466	220pF	10%	50V
2836	4822 126 13098	5,6nF	20%	16V
2837	4822 122 10459	560pF	10%	50V
2838	4822 126 12882	100nF	20%	50V
2839	4822 121 51387	10nF	20%	16V
2840	4822 122 10576	1,8nF	10%	16V
2842	4822 121 51387	10nF	20%	16V
2843	5322 124 41948	0,47µF	20%	50V
2844	4822 124 23401	4,7µF	20%	25V
2845	4822 122 33848	47pF	5%	50V
2847	4822 124 40433	47µF	20%	25V
2849	4822 124 40433	47µF	20%	25V
2850	4822 124 23178	47µF	20%	16V
2851	4822 121 51387	10nF	20%	16V
2853	4822 126 12882	100nF	20%	50V
2856	4822 121 43526	47nF	5%	100V
2857	4822 126 11585	22nF	20%	50V
2858	4822 122 33848	47pF	5%	50V
2860	4822 124 23401	4,7µF	20%	25V
2863	4822 124 23178	47µF	20%	16V
2864	4822 124 23401	4,7µF	20%	25V
2866	4822 124 23264	100µF	20%	6,3V
2867	4822 121 51387	10nF	20%	16V
2869	4822 126 12882	100nF	20%	50V
2898	4822 126 12882	100nF	20%	50V

RESISTORS

3751	4822 116 83872	220Ω	5%	0,5W
3752	4822 116 83872	220Ω	5%	0,5W
3753	4822 116 83872	220Ω	5%	0,5W
3762	4822 050 11002	1kΩ	5%	0,2W
3763	4822 050 11002	1kΩ	5%	0,2W
3764	4822 050 11002	1kΩ	5%	0,2W
3767	4822 116 52224	470Ω	5%	0,5W
3770	4822 116 52224	470Ω	5%	0,5W
3801	4822 116 52226	560Ω	5%	0,5W
3802	4822 050 11002	1kΩ	5%	0,2W
3803	4822 116 52272	330kΩ	5%	0,5W
3804	4822 116 83961	6,8kΩ	5%	0,16W
3805	4822 116 52257	22kΩ	5%	0,5W
3806	4822 116 83864	10kΩ	5%	0,5W
3807	4822 116 83864	10kΩ	5%	0,5W
3808	4822 116 52284	47kΩ	5%	0,5W
3809	4822 116 52269	3,3kΩ	5%	0,5W
3810	4822 116 52269	3,3kΩ	5%	0,5W
3811	4822 116 52257	22kΩ	5%	0,5W
3812	4822 116 52269	3,3kΩ	5%	0,5W
3813	4822 116 52269	3,3kΩ	5%	0,5W
3814	4822 116 52269	3,3kΩ	5%	0,5W
3815	4822 050 11002	1kΩ	5%	0,2W
3816	4822 116 52283	4,7kΩ	5%	0,5W
3818	4822 116 52283	4,7kΩ	5%	0,5W
3819	4822 116 83868	150Ω	5%	0,5W
3820	4822 050 11002	1kΩ	5%	0,2W
3821	4822 116 52239	120kΩ	5%	0,5W
3822	4822 116 52291	56kΩ	5%	0,5W
3824	4822 116 52239	120kΩ	5%	0,5W
3825	4822 116 83864	10kΩ	5%	0,5W
3826	4822 116 83864	10kΩ	5%	0,5W
3827	4822 116 83864	10kΩ	5%	0,5W
3828	4822 116 83864	10kΩ	5%	0,5W
3829	4822 116 83864	10kΩ	5%	0,5W
3830	4822 116 83864	10kΩ	5%	0,5W
3832	4822 116 52191	33Ω	5%	0,5W
3833	4822 050 11002	1kΩ	5%	0,2W
3835	4822 116 52264	27kΩ	5%	0,5W
3836	4822 116 52207	1,2kΩ	5%	0,5W
3837	4822 116 83961	6,8kΩ	5%	0,16W
3838	4822 116 52257	22kΩ	5%	0,5W
3839	4822 116 52207	1,2kΩ	5%	0,5W
3840	4822 116 83961	6,8kΩ	5%	0,16W
3841	4822 052 10338 ▲	3,3Ω		NFR25
3842	4822 116 83864	10kΩ	5%	0,5W
3843	4822 116 83882	39kΩ	5%	0,5W
3844	4822 050 11002	1kΩ	5%	0,2W
3845	4822 116 83882	39kΩ	5%	0,5W
3846	4822 050 11002	1kΩ	5%	0,2W
3848	4822 050 11002	1kΩ	5%	0,2W
3849	4822 052 10338 ▲	3,3Ω		NFR25
3850	4822 050 11002	1kΩ	5%	0,2W
3851	4822 116 52264	27kΩ	5%	0,5W
3852	4822 050 11002	1kΩ	5%	0,2W
3853	4822 116 83961	6,8kΩ	5%	0,16W
3855	4822 116 52278	390kΩ	5%	0,5W
3856	4822 116 52257	22kΩ	5%	0,5W
3859	4822 116 83872	220Ω	5%	0,5W
3860	4822 116 52175	100Ω	5%	0,5W

RESISTORS

3861	4822 116 52175	100Ω	5%	0,5W
3862	4822 116 52235	1MΩ	5%	0,5W
3863	4822 116 83872	220Ω	5%	0,5W
3864	4822 116 52175	100Ω	5%	0,5W
3865	4822 116 83872	220Ω	5%	0,5W
3866	4822 116 83864	10kΩ	5%	0,5W
3867	4822 116 83864	10kΩ	5%	0,5W
3868	4822 116 83864	10kΩ	5%	0,5W
3869	4822 116 83864	10kΩ	5%	0,5W
3870	4822 116 83864	10kΩ	5%	0,5W
3871	4822 116 52176	10Ω	5%	0,5W
3872	4822 116 52175	100Ω	5%	0,5W
3873	4822 116 83864	10kΩ	5%	0,5W
3874	4822 116 83864	10kΩ	5%	0,5W
3875	4822 116 52175	100Ω	5%	0,5W
3876	4822 116 52213	180Ω	5%	0,5W
3877	4822 116 52284	47kΩ	5%	0,5W
3878	4822 116 52284	47kΩ	5%	0,5W
3879	4822 116 52226	560Ω	5%	0,5W
3890	4822 050 11002	1kΩ	5%	0,2W
3891	4822 050 11002	1kΩ	5%	0,2W
3892	4822 116 52271	33kΩ	5%	0,16W
3893	4822 116 52249	1,8kΩ	5%	0,16W
3895	4822 116 52271	33kΩ	5%	0,16W

COILS

5804	4822 157 53302	1µH
5810	4822 152 20677	10µH
5860	4822 242 73557	CERAMIC RES. 8,46MHz

DIODES

6888	4822 130 80655	BZX79-F2V4
6889	4822 130 34167	BZX79-B6V2

TRANSISTORS

7820	5322 130 44779	BC338-40
7872	4822 130 44196	BC548C
7877	4822 130 40937	BC548B
7878	4822 130 44196	BC548C

INTEGRATED CIRCUITS

7800©	5322 209 11517	PC74HCU04T
7851	4822 209 32852	TDA7073A/N2
7852	4822 209 32852	TDA7073A/N2
7855©	4822 209 31519	TDA7072A
7860©	4822 209 12752	SAA7378GP
7871	4822 209 32421	TDA1311A/N2

COMBI BOARD

TABLE OF CONTENTS

Brief Introduction 11-1
Main part - Component and Chip layouts 11-2
Main part - Source Select & Amplifier 11-3
Main part - Power Supply 11-4
Transformer Primary part - Circuit & Layout 11-5
Karaoke & Headphone part - Circuit & Layouts 11-6
CDC Key part - Circuit & Layouts 11-7
Electrical parts list 11-8

Brief introduction of the Combi Board

A. TRANSFORMER PRIMARY PART

Transformer Primary Circuit provide connection for AC mains supply and primary wires of transformer.

B. POWER SUPPLY PART

Power Supply Circuit consists of rectifiers, capacitive filters and voltage regulators. Regulated voltage include +5V6, +12A, +12M, -26V, PWDN. The +C supply to the power amplifier is not regulated. F1-F2 is the ac supply voltage to the FTD Display filament.

C. SOURCE SELECT & AMPLIFIER PART

a) SHIFT REGISTER (AF CONTROL)

This shift register deliver commands from the µP to control the AF functions which include source selection (A0 & A1 control lines), DSC modes , DBB, IS and CD_ON. Other control lines such as MUTE, AMPON, STBY and PWM are coming directly from the µP on the Front board.

b) SOURCE SELECTION

One of the 4 sources, namely AUX, TAPE, TUNER, CD, can be selected via A0 & A1 lines which control the IC 7501 (HEF4052BT). Karaoke mic. mixing is connected to th e selected source before the signal is amplified with a buffer amplifier (Tr 7503 & 7504). The source signal is then split into recording path (for recording on tape) and main signal path (to the PWM volume control).

c) PWM VOLUME CONTROL

The discrete volume control makes use of 4 Transistors 7505, 7506, 7507 & 7508 (BC557B or ON4986) and PWM control signal from µP. For good performance transistors for the left and right channels should be paired for gain characteristics.

d) SOUND FEATURES

Sound Features include the DBB, IS and 4 DSC modes. The sound features are realised with a hex-inverter IC 7530 (HEF4069BT) as analog buffer/amplifier and transistors as electronic switches controlled by the shift registers (AF control).

e) POWER AMPLIFIER

IC 7391 (AN7125) is used as power amplifier.

f) CD ON CONTROL

This circuit switches on the supply +CD supply (derived from +12A) to CD servo control, HF circuit and the laser light pen on the CD Module during the CD mode only.

g) MATRIX SURROUND OUTPUT

The matrix surround feature is provided on board. This feature is only optional on certain type version.

D. KARAOKE & HEADPHONE PART

a) SIMPLE KARAOKE

This is a 1-mic. mono amplifier using discrete components. It has a level control using a rotary potmeter. This feature is available for some version only.

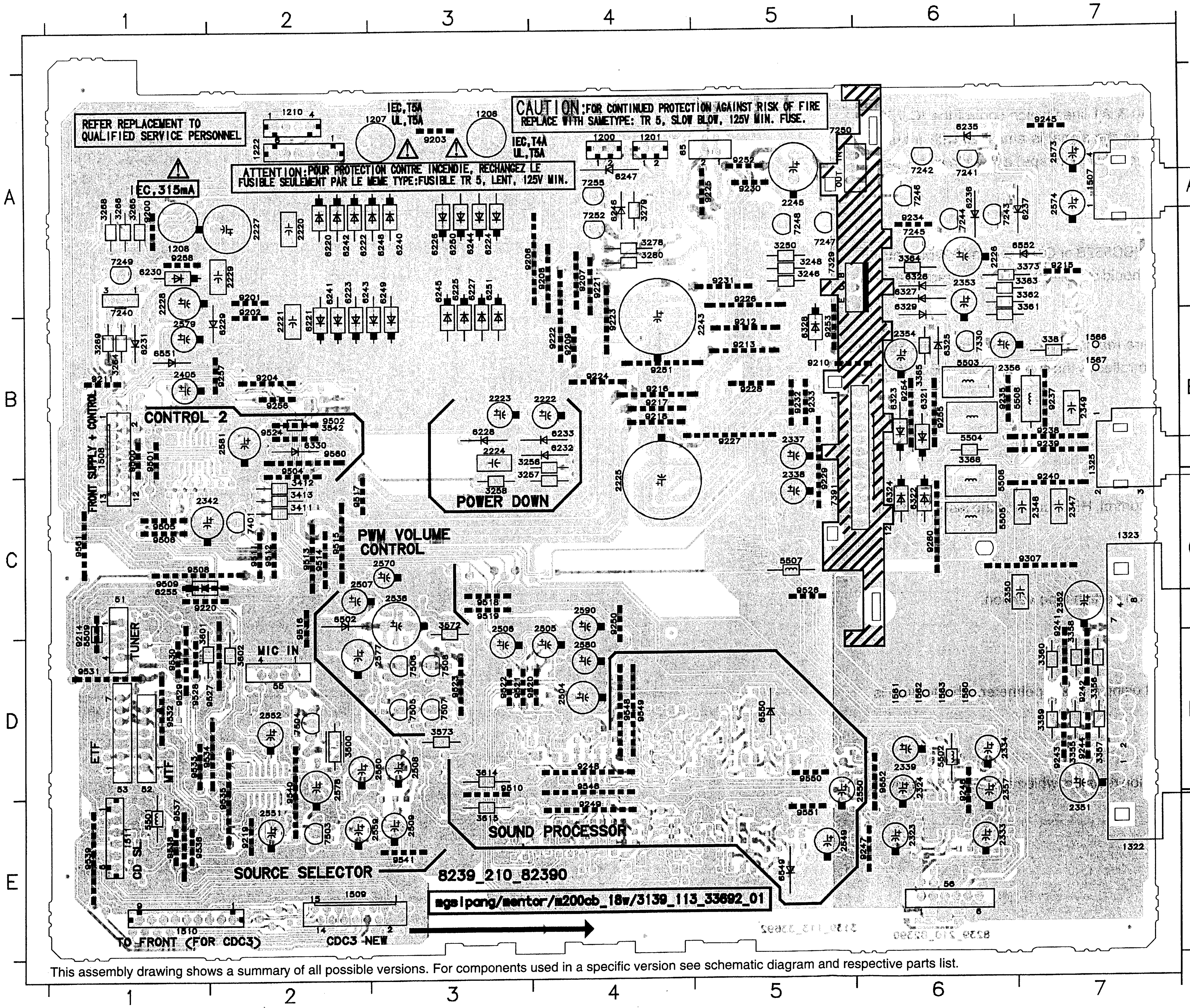
g) HEADPHONE OUTPUT

The headphone output is derived from the power amplifier output after the attenuation resistors which are tailored to deliver 18mW output power into a 32 ohm headphone.

NOTES:

COMPONENT LAYOUT - MAIN PART

51	C1	1508	B1	2227	A2	2351	E7	2552	D2	3258	C3	3363	A7	5501	E1	6228	B3	6248	A3	6550	D5	7330	B6	9209	B4	9226	A5	9244	D7	9500	B1	9519	C3	9537	E1
52	D1	1509	E2	2228	A1	2352	C7	2559	E3	3264	B1	3364	A6	5502	D6	6229	B2	6249	A3	6551	B1	7391	C5	9210	B5	9227	B5	9245	A7	9501	B1	9520	D3	9538	E1
53	D1	1510	E1	2229	A2	2353	A6	2560	D3	3265	A1	3365	B6	5503	B6	6230	A1	6250	A3	6552	A7	7401	C2	9211	B1	9228	B5	9246	D6	9502	B2	9521	D3	9539	E1
55	D2	1511	E1	2243	B5	2354	B6	2570	C3	3266	A1	3366	B6	5504	B6	6231	B1	6251	A3	7240	A1	7503	E2	9212	B5	9229	C5	9247	E6	9504	B2	9522	D3	9540	D2
56	E6	1560	D6	2245	A5	2356	B6	2573	A7	3268	A1	3373	A7	5505	C6	6232	B4	6255	C1	7241	A6	7504	D2	9213	B5	9230	A5	9248	D4	9505	C1	9523	D3	9541	E3
65	A4	1561	D6	2323	E6	2357	D6	2574	A7	3269	B1	3381	B7	5506	C6	6233	B4	6321	B6	7242	A6	7505	D3	9214	C1	9231	A5	9249	E4	9506	C1	9524	B2	9546	D4
1200	A4	1562	D6	2324	D6	2405	B1	2577	D3	3278	A4	3411	C2	5507	C5	6235	A6	6322	C6	7243	A6	7506	D3	9215	A7	9232	B5	9250	C4	9508	C1	9526	C5	9548	D4
1201	A4	1563	D6	2333	E6	2504	D4	2578	D2	3279	A4	3412	C2	5508	B6	6236	A6	6323	B6	7244	A6	7507	D3	9216	B4	9233	B5	9251	B4	9509	C1	9527	D1	9549	D4
1206	A3	1566	B7	2334	D6	2505	C4	2579	B1	3280	A4	3413	C2	5509	C1	6237	A7	6324	C6	7245	A6	7508	D3	9217	B4	9234	A6	9252	A5	9510	D3	9528	D1	9550	D5
1207	A3	1567	B7	2337	B5	2506	C3	2580	D4	3355	D7	3500	D2	6220	A2	6240	A3	6325	B6	7246	A6	9200	A1	9218	B4	9235	B6	9253	B5	9511	C2	9529	D1	9551	E5
1208	A1	2220	A2	2338	C5	2507	C2	2581	B2	3356	D7	3542	B2	6221	B2	6241	A2	6326	A6	7247	A5	9201	A2	9219	E2	9237	B7	9254	B6	9512	C2	9530	D1	9552	D6
1210	A2	2221	B2	2339	D6	2508	D3	2590	C4	3357	D7	3572	C3	6222	A2	6242	A2	6327	A6	7248	A5	9202	A2	9220	C1	9238	B7	9255	B6	9513	C2	9531	D1	9560	B2
1222	A2	2222	B4	2342	C1	2509	E3	3246	A5	3358	D7	3573	D3	6223	A2	6243	A2	6328	B5	7249	A1	9203	A3	9221	A4	9239	B7	9256	B2	9514	C2	9532	D1	9561	C1
1322	E7	2223	B3	2347	C7	2536	C3	3248	A5	3359	D7	3601	C1	6224	A3	6244	A3	6329	A6	7250	A5	9204	B2	9222	B4	9240	C7	9257	B2	9515	C2	9533	D1		
1323	C7	2224	B3	2348	C7	2549	E5	3250	A5	3360	D7	3602	D2	6225	A3	6245	A3	6330	B2	7252	A4	9206	A3	9223	B4	9241	C7	9258	A1	9516	C2	9534	D1		
1325	B7	2225	C4	2349	B7	2550	D6	3256	B3	3361	A7	3614	D3	6226	A3	6246	A4	6502	C2	7255	A4	9207	A4	9224	B4	9242	D7	9260	C6	9517	C2	9535	D2		
1507	A7	2226	A6	2350	C6	2551	E2	3257	B3	3362	A7	3615	E3	6227	A3	6247	A4	6549	E5	7329	A5	9208	A4	9225	A5	9243	D7	9307	C7	9518	C3	9536	E1		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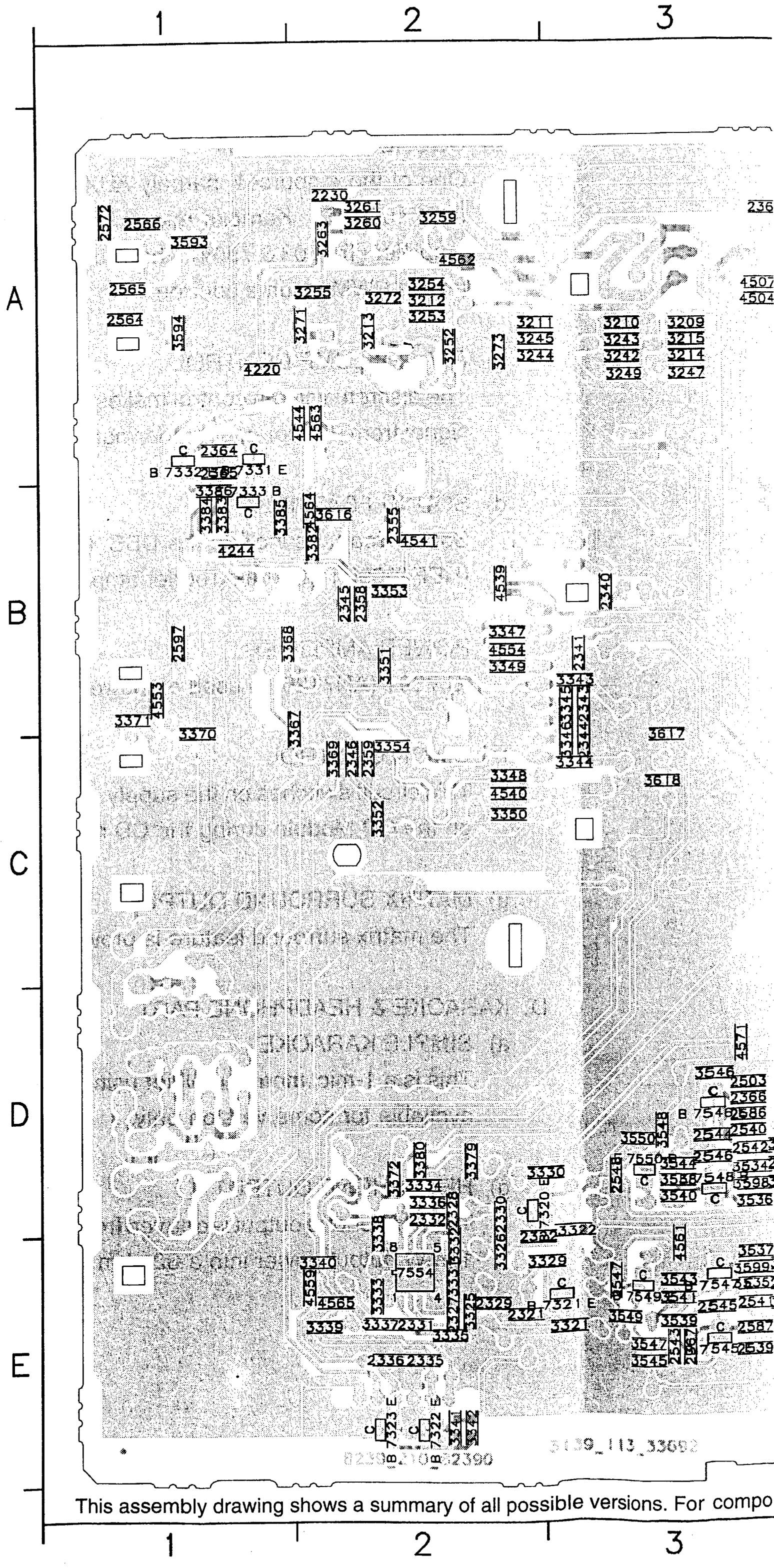
REFER REPLACEMENT TO QUALIFIED SERVICE PERSONNEL
CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE REPLACE WITH SAMETYPE: TR 5, SLOW BLOW, 125V MIN. FUSE.
ATTENTION: POUR PROTECTION CONTRE INCENDIE, RECHANGEZ LE FUSIBLE SEULEMENT PAR LE MEME TYPE: FUSIBLE TR 5, LENT, 125V MIN.
IEC,T5A UL,T5A
IEC,T4A UL,T5A
IEC,315mA
CONTROL 2
FRONT SUPPLY + CONTROL
POWER DOWN
PWM VOLUME CONTROL
TUNER
MIC IN
ETF
MTF
CD SL
SOUND PROCESSOR
SOURCE SELECTOR
8239_210_82390
mgs\pang/mentor/m200cb_18w/3139_113_33692_01
TO FRONT (FOR CDC3)
CDC3 NEW

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

CHIP LAYOUT - MAIN PART

2230	A2	2364	A1	2523	E4	2548	D3	2587	E3	3253	A2	3331	E2
2321	E2	2365	A1	2524	D4	2553	D7	2588	E5	3254	A2	3332	E2
2322	E2	2366	D3	2525	E4	2554	D7	2589	E5	3255	A2	3333	E2
2327	E2	2367	E3	2526	D4	2555	C7	2591	D5	3259	A2	3334	D2
2328	D2	2400	C6	2527	E4	2556	C7	2592	D5	3260	A2	3335	E2
2329	E2	2401	C6	2528	D4	2557	E7	2594	D5	3261	A2	3336	D2
2330	D2	2402	C6	2529	E4	2558	E7	2595	D6	3263	A2	3337	E2
2331	E2	2403	B6	2530	D6	2561	E6	2596	D6	3271	A2	3338	D2
2332	D2	2501	E6	2531	D5	2562	C5	2597	B1	3272	A2	3339	E2
2335	E2	2502	D6	2532	D4	2563	E7	3209	A3	3273	A2	3340	E2
2336	E2	2503	D3	2533	E4	2564	A1	3210	A3	3274	A4	3341	E2
2340	B3	2510	D5	2534	D3	2565	A1	3211	A2	3275	A4	3342	E2
2341	B3	2511	D5	2535	E3	2566	A1	3212	A2	3276	A4	3343	B3
2343	B3	2512	D5	2537	E3	2567	D4	3213	A2	3277	A4	3344	C3
2344	C3	2513	D5	2538	D3	2568	B7	3214	A3	3281	A4	3345	B3
2345	B2	2514	D5	2539	E3	2569	B7	3215	A3	3282	A4	3346	C3
2346	C2	2515	E5	2540	D3	2572	A1	3242	A3	3283	A4	3347	B2
2355	B2	2516	D5	2541	E3	2575	E4	3243	A3	3321	E3	3348	C2
2358	B2	2517	E5	2542	D3	2576	D4	3244	A2	3322	D3	3349	B2
2359	C2	2518	D4	2543	E3	2582	D5	3245	A2	3325	E2	3350	C2
2360	A3	2519	E4	2544	D3	2583	E5	3247	A3	3326	E2	3351	B2
2361	D7	2520	D4	2545	E3	2584	D4	3249	A3	3328	D4	3352	C2
2362	B6	2521	E4	2546	D3	2585	E4	3251	B7	3329	E2	3353	B2
2363	B6	2522	D4	2547	E3	2586	D3	3252	A2	3330	D2	3354	C2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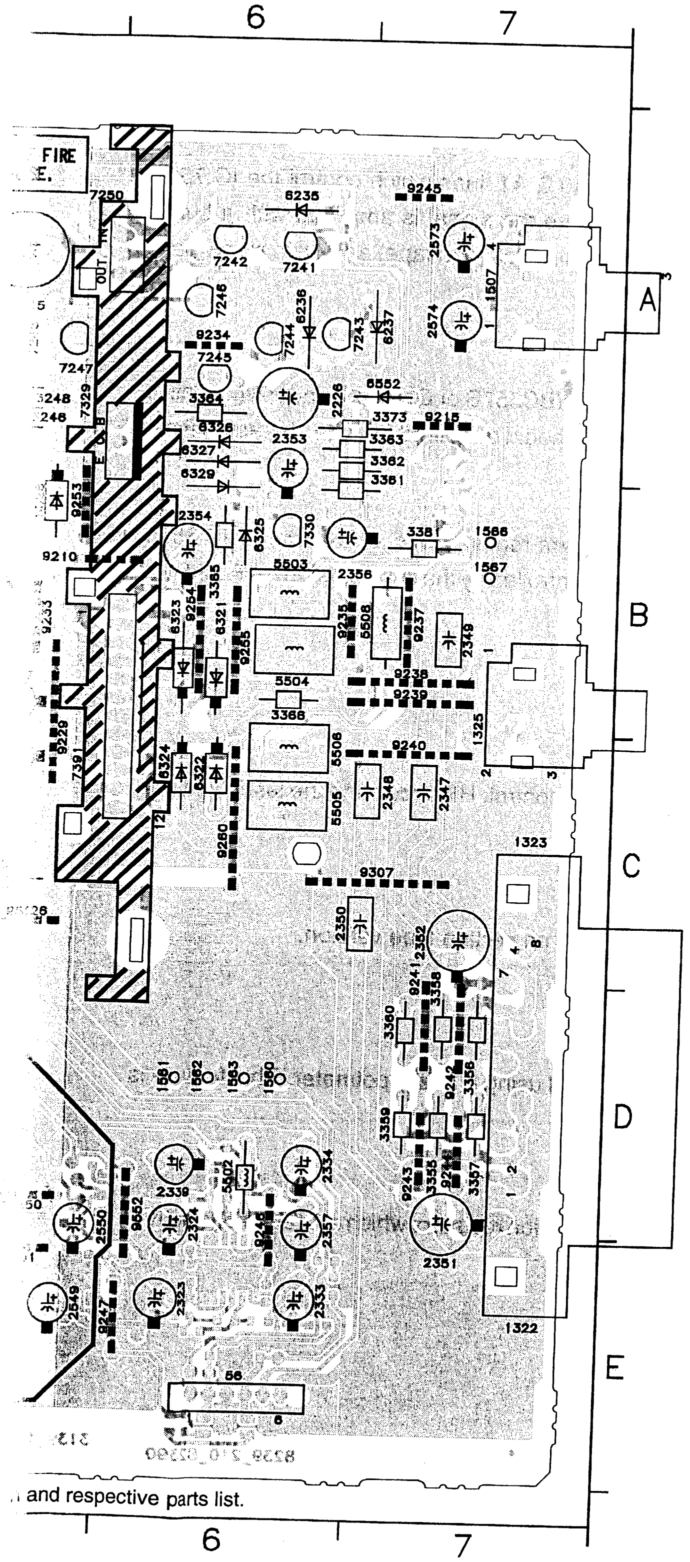
8239_210_82390
3139_113_33692

This assembly drawing shows a summary of all possible versions. For compo

9209	B4
9210	B5
9211	B1
9212	B5
9213	B5
9214	C1
9215	A7
9216	B4
9217	B4
9218	B4
9219	E2
9220	C1
9221	A4
9222	B4
9223	B4
9224	B4
9225	A5
9226	A5
9227	B5
9228	B5
9229	C5
9230	A5
9231	A5
9232	B5
9233	B5
9234	A6
9235	B6
9237	B7
9238	B7
9239	B7
9240	C7
9241	C7
9242	D7
9243	D7
9244	D7
9245	A7
9246	D6
9247	E6
9248	D4
9249	E4
9250	C4
9251	B4
9252	A5
9253	B5
9254	B6
9255	B6
9256	B2
9257	B2
9258	A1
9260	C6
9307	C7
9500	B1
9501	B1
9502	B2
9504	B2
9505	C1
9506	C1
9508	C1
9509	C1
9510	D3
9511	C2
9512	C2
9513	C2
9514	C2
9515	C2
9516	C2
9517	C2
9518	C3
9519	C3
9520	D3
9521	D3
9522	D3
9523	D3
9524	B2
9526	C5
9527	D1
9528	D1
9529	D1
9530	D1
9531	D1
9532	D1
9533	D1
9534	D1
9535	D2
9536	E1
9537	E1
9538	E1
9539	E1
9540	D2
9541	E3
9546	D4
9548	D4
9549	D4
9550	D5
9551	E5
9552	D6
9560	B2
9561	C1



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FIRE
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8239 210 02390

...and respective parts list.

CHIP LAYOUT - MAIN PART

2230	A2
2321	E2
2322	E2
2327	E2
2328	D2
2329	E2
2330	D2
2331	E2
2332	D2
2335	E2
2336	E2
2340	B3
2341	B3
2343	B3
2344	C3
2345	B2
2346	C2
2355	B2
2358	B2
2359	C2
2360	A3
2361	D7
2362	B6
2363	B6
2364	A1
2365	A1
2366	D3
2367	E3
2400	C6
2401	C6
2402	C6
2403	B6
2501	E6
2502	D6
2503	D3
2510	D5
2511	D5
2512	D5
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2514	D5
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2554	D7
2555	C7
2556	C7
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2558	E7
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2564	A1
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2566	A1
2567	D4
2568	B7
2569	B7
2572	A1
2575	E4
2576	D4
2582	D5
2583	E5
2584	D4
2585	E4
2586	D3
2587	E3
2588	E5
2589	E5
2591	D5
2592	D5
2594	D5
2595	D6
2596	D6
2597	B1
3209	A3
3210	A3
3211	A2
3212	A2
3213	A2
3214	A3
3215	A3
3242	A3
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3276	A4
3277	A4
3281	A4
3282	A4
3283	A4
3321	E3
3322	D3
3325	E2
3326	E2
3328	D4
3329	E2
3330	D2
3331	E2
3332	E2
3333	E2
3334	D2
3335	E2
3336	D2
3337	E2
3338	D2
3339	E2
3340	E2
3341	E2
3342	E2
3343	B3
3344	C3
3345	B3
3346	C3
3347	B2
3348	C2
3349	B2
3350	C2
3351	B2
3352	C2
3353	B2
3354	C2
3367	B2
3368	B1
3369	C2
3370	B1
3371	B1
3372	D2
3378	B7
3379	D2
3380	D2
3382	B2
3383	B1
3384	B1
3385	B1
3386	B1
3387	B6
3388	B6
3390	E6
3391	E5
3392	D5
3400	C7
3401	B7
3402	B6
3403	B7
3404	B6
3405	C7
3406	C7
3407	C7
3409	B7
3410	B7
3501	D5
3502	D5
3503	E4
3504	D4
3505	E4
3506	D4
3507	E4
3508	D4
3509	E4
3510	D4
3511	E4
3512	D4
3513	E4
3514	D4
3515	E4
3516	D4
3517	D6
3518	D4
3519	E4
3520	D4
3521	E4
3522	D4
3523	E4
3524	D4
3525	E4
3526	D4
3527	E4
3528	D4
3529	E4
3530	D3
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3532	D3
3533	E3
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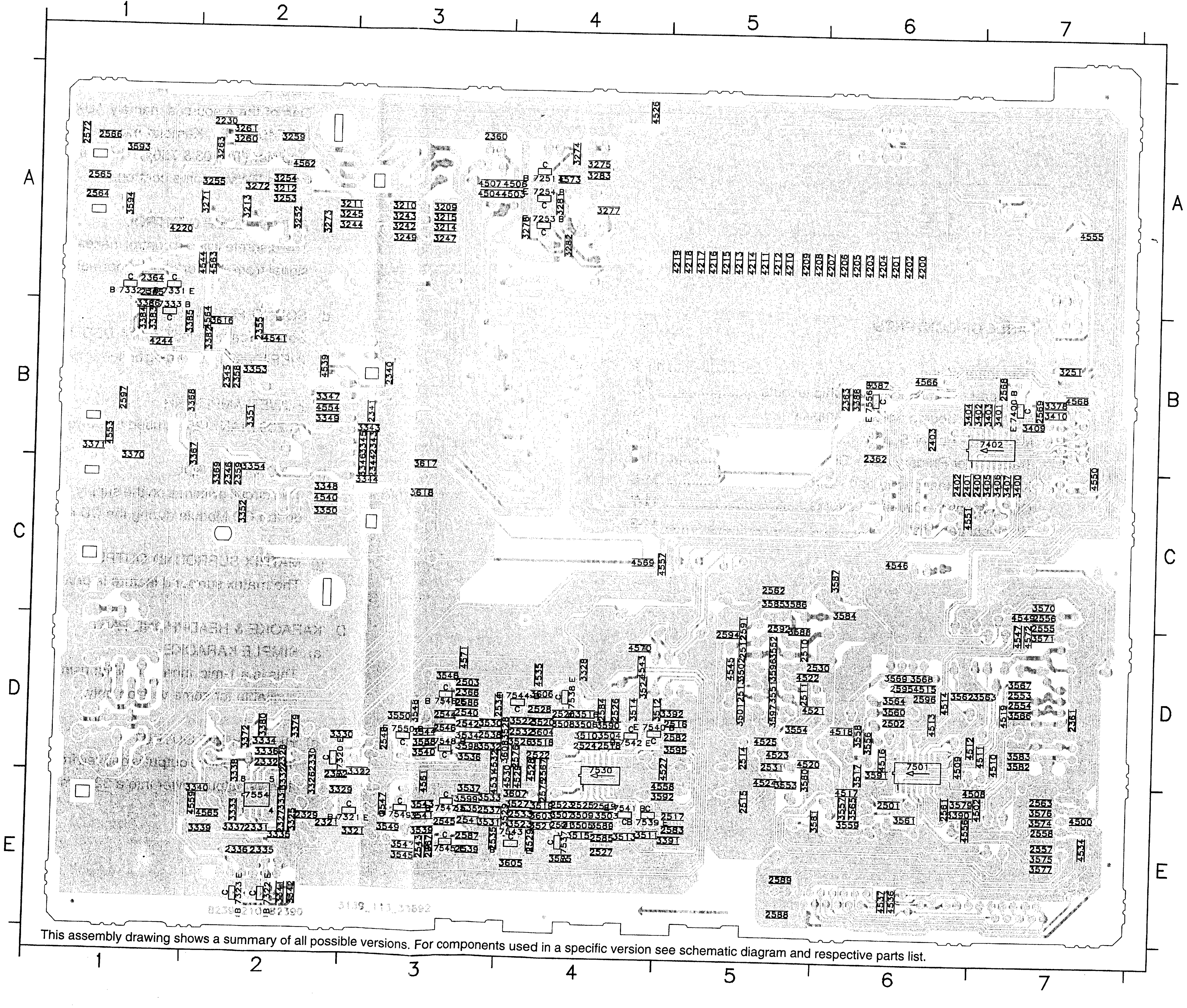
3535	E3
3536	D3
3537	E3
3538	D3
3539	E3
3540	D3
3541	E3
3543	E3
3544	D3
3545	E3
3546	D3
3547	E3
3548	D3
3549	E3
3550	D3
3551	D5
3552	D5
3553	E5
3554	D5
3556	D6
3557	E6
3558	D6
3559	E6
3560	D6
3561	E6
3562	D6
3563	D7
3564	D6
3565	E6
3566	D7
3567	D7
3568	D6
3569	D6
3570	C7
3571	D7
3574	E7
3575	E7
3576	E7
3577	E7
3579	E6
3580	D5
3581	E6
3582	D7
3583	D7
3584	C6
3585	C5
3586	C5
3587	C6
3588	D5
3589	E4
3590	D4
3591	D6
3592	E5
3593	A1
3594	A1
3595	D5
3596	D5
3597	D5
3598	D3
3599	E3
3603	E4
3604	D4
3605	E4
3606	D4
3607	E4
3608	D4
3616	B2
3617	C3
3618	C3
4200	A6
4201	A6
4202	A6
4203	A6
4204	A6
4205	A6
4206	A6
4207	A6
4208	A5
4209	A5
4210	A5
4211	A5
4212	A5
4213	A5
4214	A5
4215	A5
4216	A5
4217	A5
4218	A5
4219	A5
4220	A1
4244	B1
4500	E7
4502	E7
4503	A4
4504	A3
4506	A4
4507	A3
4508	E7
4509	D6
4510	D7
4511	D7
4512	D6
4513	D6
4514	D6
4515	D6
4516	D6
4517	E6
4518	D6
4519	D7
4520	D5
4521	D5
4522	D5
4523	D5
4524	D5
4525	D5
4526	A4
4527	D5
4528	D4
4529	D4
4530	D4
4531	E3
4532	D3
4534	E7
4535	D4
4536	E6
4537	E6
4539	B2
4540	C2
4541	B2
4543	D4
4544	A2
4545	D5
4546	C6
4547	D7
4549	C7
4550	C7
4551	C6
4553	B1
4554	B2
4555	A7
4556	E6
4557	C5
4558	E5
4559	E2
4561	E3
4562	A2
4563	A2
4564	B2
4565	E2
4566	B6
4568	B7
4569	C4
4570	D4
4571	D3
4572	D7
4573	A4
7251	A4
7253	A4
7254	A4
7320	D2
7321	E3
7322	E2
7323	E2
7331	A1
7332	A1
7333	B1
7400	B7
7402	B7
7501	D6
7530	D4
7537	E4
7538	D4
7539	E4
7540	D4
7541	E4
7542	D4
7543	E4
7544	D4
7545	E3
7546	D3
7547	E3
7548	D3
7549	E3
7550	D3
7554	E2
7556	B6



1
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6
7
A
B
C
D
E
2230
3261
3260
3259
2572
2566
3593
4562
2565
2564
3594
3255
3272
3254
3212
3253
3211
3245
3244
3210
3243
3242
3249
3209
3215
3214
3247
2360
4507
4506
4504
4503
7251
4573
3275
3283
3277
7254
7253
3282
4220
4526
4555
2364
7332
7331
3386
3333
4244
3616
4541
4539
2340
3353
3347
4554
3349
2341
3343
3371
3370
3817
3818
3348
4540
3350
3352
3354
3387
4566
3251
4568
7400
3409
3410
7402
2362
2303
4551
3550
4569
4546
2582
3584
3570
2594
2591
4570
4522
2530
4521
3568
4525
2514
2531
4520
2515
3581
2501
3561
3555
7501
4500
2563
3576
3574
2558
2557
3575
3577
2589
2588
7530
3605
7554
7321
2321
3321
3339
2336
2335
7323
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.
8239 210 02390
3139 113 31893

CIRCUIT DIAGRAM - SOURCE SELECT & AMPLIFIER PART

51 D1
52 B1
53 B2
55 B5
56 C15
65 B1
1322-A H14
1322-B G14
1323-A H15
1323-B H15
1323-C G15
1323-D G15
1325 G15
1507 A1
1508 F1
1509 F1
1510 D1
1511 F1
2321 B12
2322 D11
2323 C12
2324 C12
2327 B12
2328 D12
2329 C13
2330 C13
2331 B13
2332 D13
2333 B14
2334 D14
2335 B15
2336 D15
2337 G9
2338 H9
2339 A12
2340 E8
2341 F8
2342 H6
2343 G10
2344 H10
2345 G12
2346 H12
2347 G12
2348 H12
2349 G13
2350 H13
2351 H15
2352 G15
2353 F10
2354 F10
2355 F11
2356 E14
2357 C13
2358 G13
2359 H13
2360 B1
2361 B2
2362 H8
2363 H7
2364 F12
2365 E13
2366 D9
2367 B9
2400 H3
2401 H3
2402 H3
2403 H1
2405 G1
2501 B5
2502 D5
2503 E9
2504 F7
2505 F7
2506 F6
2507 G4
2508 G4
2509 F4
2510 G4
2511 F4
2512 H5
2513 F5
2514 C6
2515 C6
2516 E6
2517 B6
2518 D7
2519 B7
2520 D7
2521 B7
2522 D7
2523 B7
2524 E7
2525 A7
2526 E7
2527 A7
2528 E8
2529 B8
2530 H4
2531 F4
2532 D8
2533 C8
2534 E8
2535 A8
2536 G5
2537 C9
2538 D9
2539 B9
2540 D9
2541 B9
2542 D9
2543 A9
2544 E9
2545 B10
2546 D10
2547 B10
2548 D10
2549 C11
2550 C11
2551 B4
2552 C4
2553 B2
2554 B3
2555 C2
2556 D2
2557 E3
2558 E2
2559 E4
2560 E4
2561 D3
2562 G7
2563 F2
2564 A2
2565 A2
2566 A1
2567 B7
2568 G1
2569 F2
2570 G4
2572 A2
2573 A2
2574 A2
2575 C8
2576 C8
2577 G7
2578 A5
2579 D4
2580 D8
2581 H2
2582 E6
2583 B5
2584 E7
2585 A7
2586 D9
2587 B9
2588 E1
2589 F1
2590 E9
2591 F5
2592 G5
2594 G5
2595 C5
2596 C5
2597 F14
3251 E4
3321 C11
3322 C11
3325 B12
3326 D12
3328 E9
3329 B11
3330 D11
3331 C12
3332 C12
3333 B13
3334 D13
3335 B13
3336 D13
3337 B14
3338 D14
3339 B14
3340 D14
3341 C14
3342 C14
3343 G9
3344 H9
3345 G10
3346 H10
3347 G12
3348 H12
3349 G12
3350 H12
3351 G12
3352 H12
3353 F12
3354 H12
3355 H14
3356 G14
3357 H14
3358 G14
3359 H14
3360 H14
3361 F11
3362 F11
3363 F11
3364 E11
3365 G12
3366 G12
3367 G13
3368 G13
3369 G13
3370 F14
3371 F14
3372 C13
3373 F10
3378 B14
3379 A12
3380 A12
3381 E14
3382 E14
3383 E12
3384 E12
3385 F13
3386 E13
3387 H8
3388 H7
3390 D4
3391 B6
3392 E6
3400 G3
3401 G3
3402 G3
3403 G3
3404 G2
3405 G2
3406 G2
3407 G2
3409 G1
3410 G1
3411 G6
3412 G6
3413 G6
3500 A5
3501 F5
3502 H5
3503 B7
3504 D7
3505 B6
3506 D6
3507 B7
3508 D7
3509 B6
3510 E6
3511 A6
3512 F6
3513 A6
3514 E6
3515 A6
3516 E6
3517 A4
3518 C8
3519 C8
3520 E8
3521 A8
3522 E8
3523 A8
3524 D8
3525 B8
3526 D8
3527 C8
3528 E8
3529 B8
3530 D9
3531 C9
3532 D9
3533 C9
3534 D9
3535 B9
3536 D9
3537 B9
3538 D10
3539 B10
3540 D10
3541 B10
3542 H2
3543 B10
3544 D10
3545 A10
3546 E9
3547 A10
3548 E10
3549 B11
3550 E11
3551 F4
3552 H4
3553 F4
3554 H4
3556 C5
3557 A5
3558 C5
3559 A5
3560 C5
3561 A5
3562 A3
3563 A3
3564 D5
3565 B5
3566 C3
3567 B3
3568 C4
3569 B4
3570 C3
3571 C3
3572 H5
3573 E5
3574 D3
3575 D3
3576 E3
3577 D3
3579 D4
3580 E3
3581 E3
3582 E3
3583 E3
3584 G7
3585 G7
3586 G5
3587 G4
3588 G5
3589 A7
3590 E7
3591 A3
3592 D6
3593 A2
3594 A2
3595 B6
3596 H5
3597 F5
3598 C10
3599 C10
3601 A2
3602 A2
3603 C8
3604 D8
3605 A7
3606 E7
3607 C8
3608 C8
3614 C6
3615 C6
3616 E14
3617 G9
3618 H9
4503 B1
4504 B1
4506 B1
4507 C1
5501 E2
5502 C13
5503 G12
5504 G12
5505 H12
5506 H12
5507 H8
5508 F10
5509 C1
6255 E2
6321 G12
6322 H12
6323 G12
6324 H12
6325 F12
6326 E10
6327 F11
6328 E11
6329 F12
6330 F1
6502 G8
6549 A10
6550 E10
6551 E4
6552 E14
7320 C11
7321 C11
7322 B14
7323 C14
7329 E11
7330 F11
7331 E12
7332 E13
7333 F13
7391 F11
7400 F1
7401 G6
7402 H2
7501 A3
7503 B5
7504 C5
7505 F5
7506 H5
7507 F5
7508 H5
7530 C7
7537 B8
7538 D8
7539 A6
7540 E6
7541 A7
7542 F7
7543 A8
7544 E8
7545 A9
7546 E9
7547 B9
7548 D9
7549 A10
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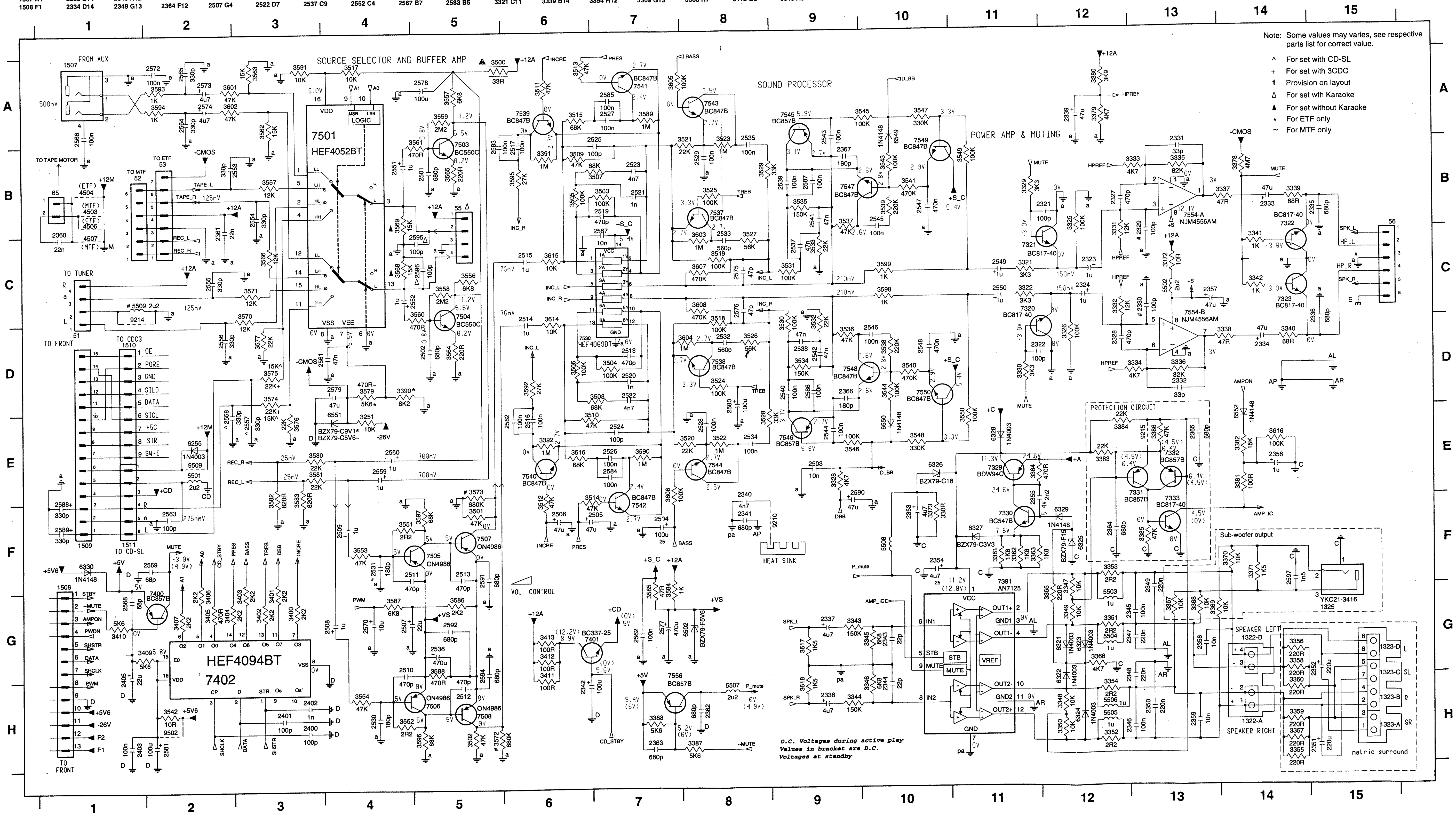
7554-A B13
7554-B C13
7556 G7
9210 F9
9214 C1
9215 E13
9502 H2
9509 E2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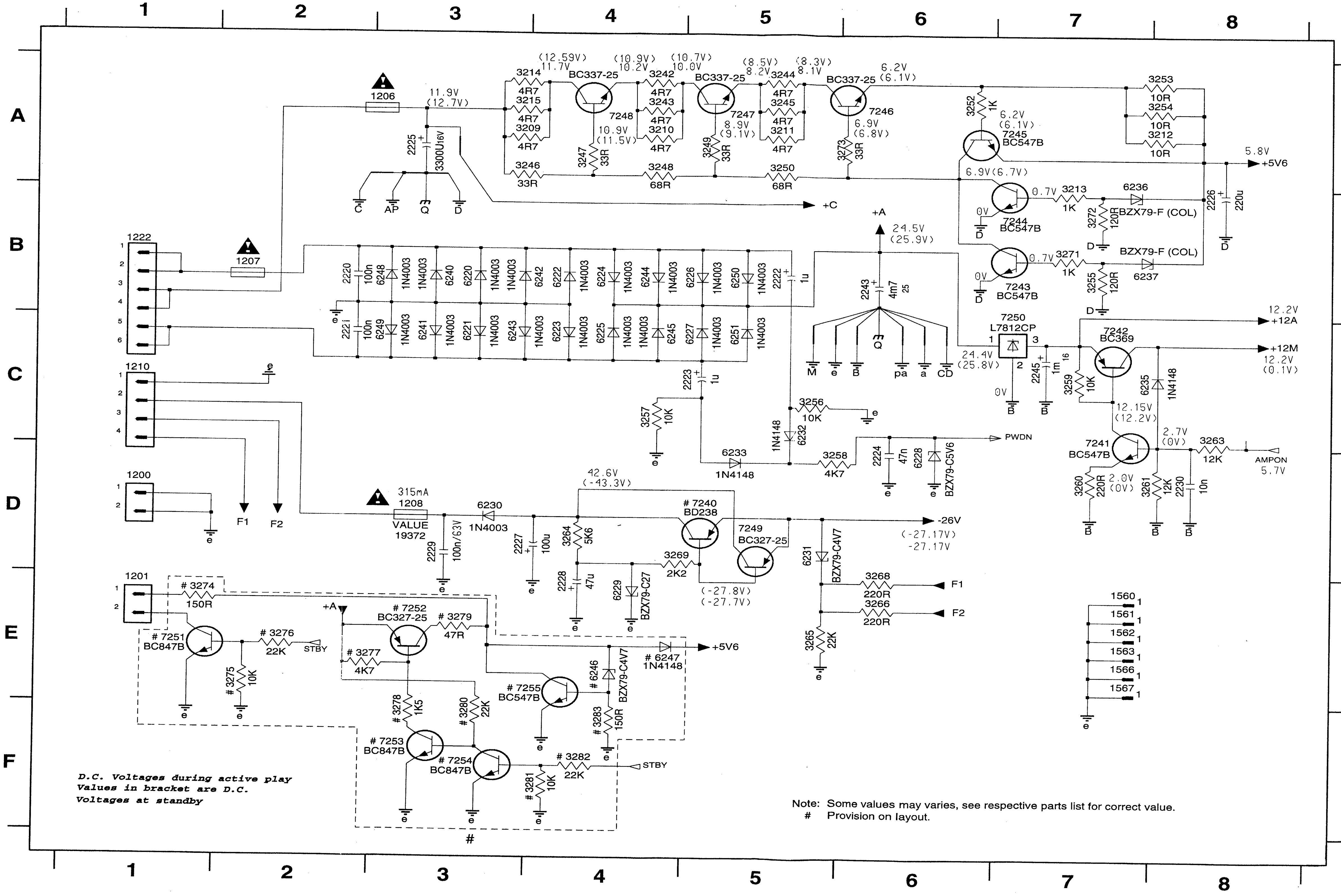
12
13
14
15
A
B
C
D
E
F
G
H
SOURCE SELECTOR AND BUFFER AMP
SOUND PROCESSOR
POWER AMP & MUTING
PROTECTION CIRCUIT
Sub-woofer output
SPEAKER LEFT
SPEAKER RIGHT
matric surround
HEAT SINK
VOL. CONTROL
FROM AUX
1507
TO TAPE MOTOR
TO TUNER
TO FRONT
TO CDC3
TO CD-SL
TO MTF
TO ETF
7501
HEF4052BT
7402
HEF4094BT
7530 HEF4066BT
7554-A NJM4556AM
7554-B NJM4556AM
7391 AN7125
YKC21-3416
1325
1322-A
1322-B
-CMOS
+12A
+12M
+5V6
+S_C
+CD
+VS
MUTE
P_mute
AMP_IC
AMPON
INCRE
PRES
BASS
TREB
DBB
HPREF
SPK_L
SPK_R
REC_L
REC_R
CD_STBY
OE
PORE
GND
SILD
DATA
SICL
+5C
SIR
SW-I
STBY
-MUTE
AMPON
PWDN
SHSTR
DATA
SHCLK
PWM
-26V
F2
F1
IN1
IN2
STB
MUTE
VREF
OUT1+
OUT1-
OUT2-
OUT2+
GND1
GND2
VCC
AL
AR
AP
SL
SR
L
R

Note: Some values may varies, see respective parts list for correct value.

^ For set with CD-SL
+ For set with 3CDC
# Provision on layout
Δ For set wth Karaoke
▲ For set without Karaoke
* For ETF only
~ For MTF only

D.C. Voltages during active play
Values in bracket are D.C. Voltages at standby

CIRCUIT DIAGRAM - POWER SUPPLY PART


1
2
3
4
5
6
7
8
A
B
C
D
E
F
1206
11.9V
(12.7V)
2225
3300U16V
C
AP
Q
D
+C
(12.59V)
11.7V
3214
4R7
3215
4R7
3209
4R7
3246
33R
BC337-25
7248
10.9V
(11.5V)
3247
33R
(10.9V)
10.2V
(10.7V)
10.0V
3242
4R7
3243
4R7
3210
4R7
3248
68R
BC337-25
7247
8.9V
(9.1V)
3249
33R
(8.5V)
8.2V
(8.3V)
8.1V
3244
4R7
3245
4R7
3211
4R7
3250
68R
BC337-25
7246
6.2V
(6.1V)
6.9V
(6.8V)
3273
33R
3252
1K
6.2V
(6.1V)
7245
BC547B
3253
10R
3254
10R
3212
10R
5.8V
+5V6
6.9V(6.7V)
0.7V
3213
1K
6236
0V
7244
BC547B
3272
120R
BZX79-F (COL)
2226
220u
0.7V
3271
1K
7243
BC547B
3255
120R
6237
BZX79-F (COL)
+A
24.5V
(25.9V)
2243
4m7
25
M
e
B
Q
pa
a
CD
1222
1
2
3
4
5
6
1207
2220
100n
6248
1N4003
1N4003
6240
6220
1N4003
1N4003
6242
6222
1N4003
6224
1N4003
6244
1N4003
6226
1N4003
6250
1N4003
2222
1u
2221
100n
6249
1N4003
6241
1N4003
6221
1N4003
6243
1N4003
6223
1N4003
6225
1N4003
6245
6227
1N4003
6251
1N4003
7250
L7812CP
1
2
3
24.4V
(25.8V)
0V
2245
1m
16
12.2V
+12A
7242
BC369
+12M
12.2V
(0.1V)
3259
10K
6235
1N4148
12.15V
(12.2V)
2.7V
(0V)
3263
12K
AMPON
5.7V
7241
BC547B
3260
220R
2.0V
(0V)
3261
12K
2230
10n
1210
1
2
3
4
2223
1u
3257
10K
3256
10K
6232
1N4148
6233
1N4148
3258
4K7
2224
47n
6228
BZX79-C5V6
PWDN
1200
1
2
F1
F2
315mA
1208
VALUE
19372
6230
1N4003
2229
100n/63V
2227
100u
42.6V
(-43.3V)
3264
5K6
7240
BD238
7249
BC327-25
-26V
(-27.17V)
-27.17V
3269
2K2
2228
47u
6229
BZX79-C27
(-27.8V)
(-27.7V)
6231
BZX79-C4V7
3268
220R
F1
3266
220R
F2
3265
22K
1201
1
2
# 3274
150R
# 7251
BC847B
# 3276
22K
STBY
# 3275
10K
+A
# 7252
BC327-25
# 3279
47R
# 3277
4K7
+5V6
# 6247
1N4148
# 6246
BZX79-C4V7
# 7255
BC547B
# 3283
150R
# 3278
1K5
# 3280
22K
# 7253
BC847B
# 7254
BC847B
# 3282
22K
STBY
# 3281
10K
#
1560
1561
1562
1563
1566
1567
1

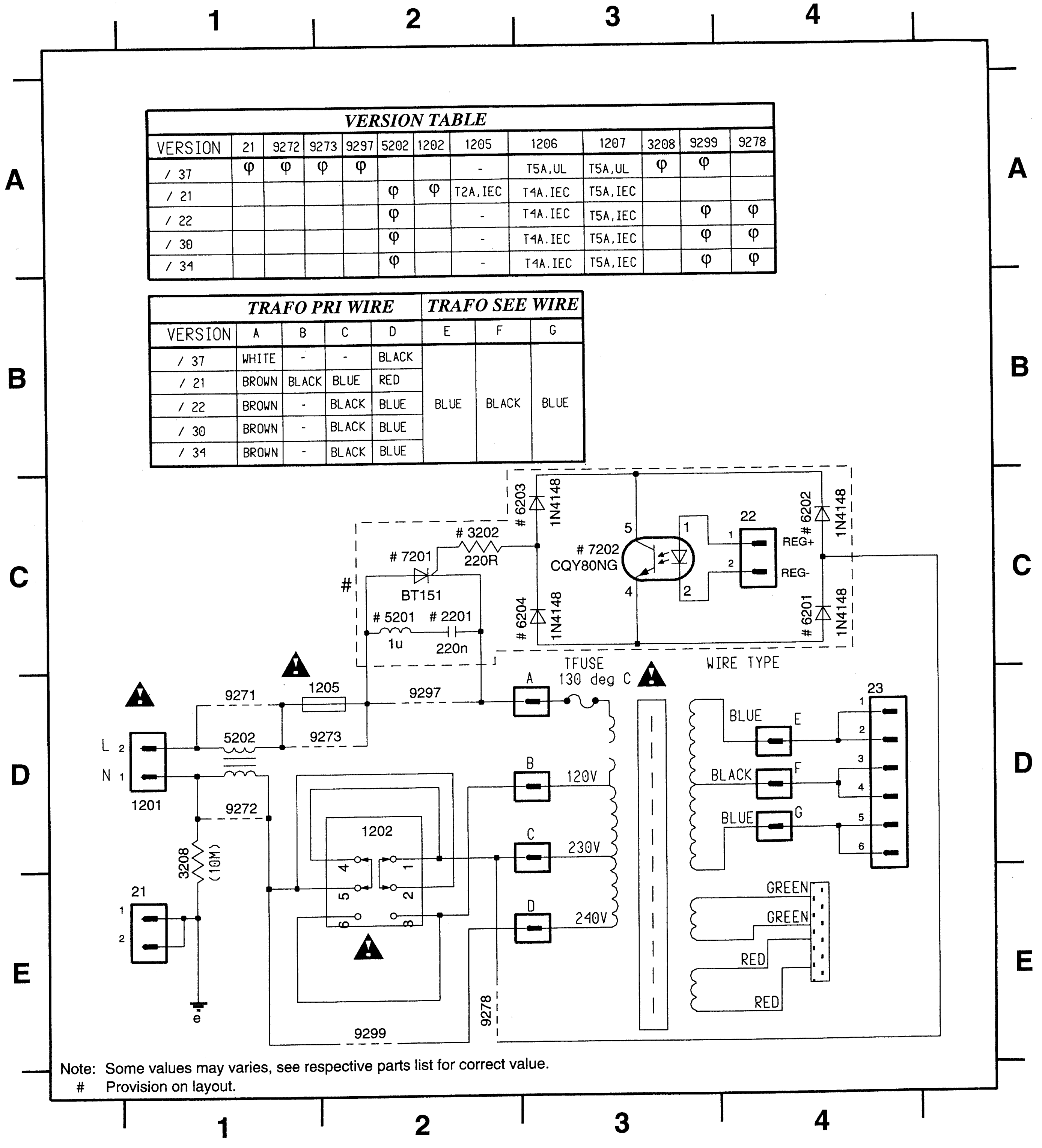
D.C. Voltages during active play
Values in bracket are D.C.
Voltages at standby

Note: Some values may varies, see respective parts list for correct value.
# Provision on layout.

1200	D1
1201	E1
1206	A3
1207	B2
1208	D3
1210	C1
1222	B1
1560	E7
1561	E7
1562	E7
1563	E7
1566	E7
1567	E7
2220	B2
2221	C2
2222	B5
2223	C5
2224	D6
2225	A3
2226	B8
2227	D3
2228	E4
2229	D3
2230	D8
2243	B6
2245	C7
3209	A3
3210	A4
3211	A5
3212	A8
3213	A7
3214	A3
3215	A3
3242	A4
3243	A4
3244	A5
3245	A5
3246	A3
3247	A4
3248	A4
3249	A5
3250	A5
3252	A6
3253	A8
3254	A8
3255	B7
3256	C5
3257	C4
3258	D5
3259	C7
3260	D7
3261	D7
3263	C8
3264	D4
3265	E5
3266	E6
3268	E6
3269	D4
3271	B7
3272	B7
3273	A6
3274	E1
3275	E2
3276	E2
3277	E2
3278	F3
3279	E3
3280	F3
3281	F4
3282	F4
3283	F4
6220	B3
6221	C3
6222	B4
6223	C4
6224	B4
6225	C4
6226	B5
6227	C5
6228	D6
6229	E4
6230	D3
6231	D5
6232	C5
6233	D5
6235	C7
6236	A7
6237	B7
6240	B3
6241	C3
6242	B4
6243	C3
6244	B4
6245	C4
6246	E4
6247	E4
6248	B3
6249	C3
6250	B5
6251	C5
7240	D4
7241	C7
7242	C7
7243	B7
7244	B7
7245	A7
7246	A6
7247	A5
7248	A4
7249	D5
7250	B7
7251	E1
7252	E3
7253	F3
7254	F3
7255	E4

CIRCUIT DIAGRAM - TRANSFORMER PRIMARY PART

Item	Pos.
21	E1
22	C4
23	D4
1201	D1
1202	D2
1205	D2
2201	C2
3202	C2
3208	D1
5201	C2
5202	D1
6201	C4
6202	C4
6203	C3
6204	C3
7201	C2
7202	C3
9271	D1
9272	D1
9273	D2
9278	E2
9297	D2
9299	E2



1
2
3
4
A
B
C
D
E
# 6203
1N4148
# 6202
1N4148
# 6204
1N4148
# 6201
1N4148
# 3202
220R
# 7201
BT151
# 7202
CQY80NG
# 5201
1u
# 2201
220n
22
REG+
REG-
#
TFUSE
130 deg C
WIRE TYPE
9271
1205
9297
9273
5202
9272
L
N
1201
3208
(10M)
21
e
1202
A
B
C
D
120V
230V
240V
9278
9299
23
BLUE
BLACK
BLUE
E
F
G
GREEN
GREEN
RED
RED

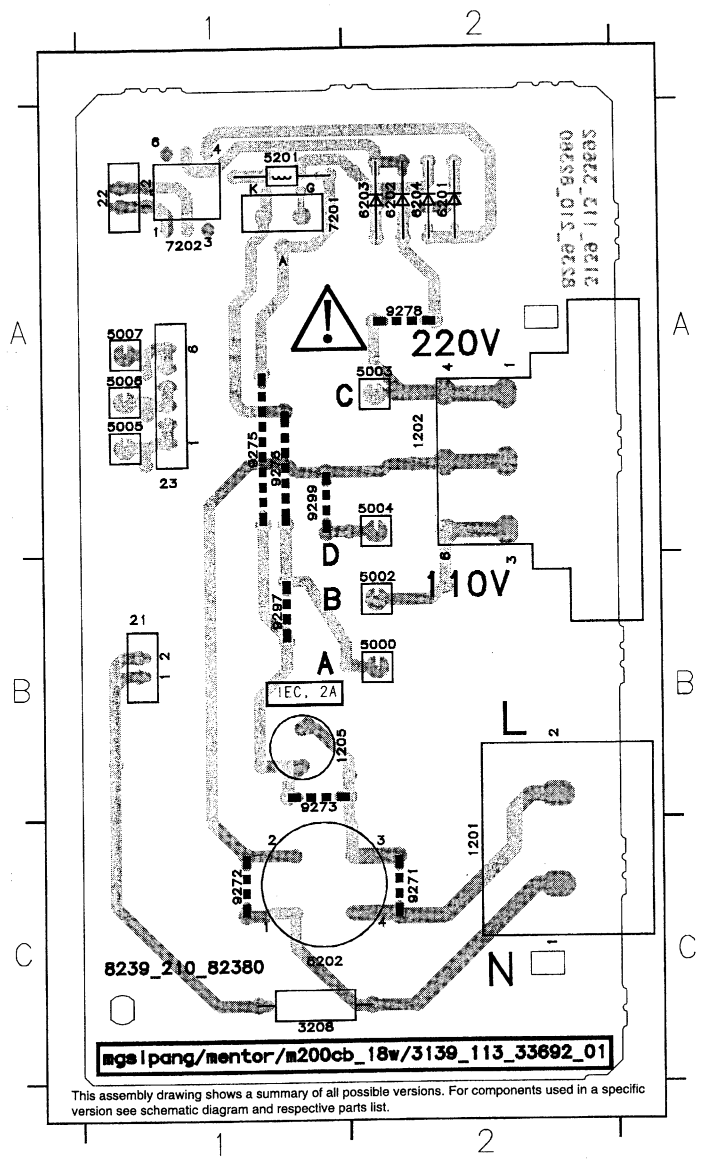
VERSION TABLE												
VERSION	21	9272	9273	9297	5202	1202	1205	1206	1207	3208	9299	9278
/ 37	φ	φ	φ	φ			-	T5A,UL	T5A,UL	φ	φ	
/ 21					φ	φ	T2A,IEC	T4A.IEC	T5A,IEC			
/ 22					φ		-	T4A.IEC	T5A,IEC		φ	φ
/ 30					φ		-	T4A.IEC	T5A,IEC		φ	φ
/ 34					φ		-	T4A.IEC	T5A,IEC		φ	φ

	TRAFO PRI WIRE				*TRAFO SEE WIRE*		
VERSION	A	B	C	D	E	F	G
/ 37	WHITE	-	-	BLACK	BLUE	BLACK	BLUE
/ 21	BROWN	BLACK	BLUE	RED			
/ 22	BROWN	-	BLACK	BLUE			
/ 30	BROWN	-	BLACK	BLUE			
/ 34	BROWN	-	BLACK	BLUE			

Note: Some values may varies, see respective parts list for correct value.
# Provision on layout.

COMPONENT & CHIP LAYOUT - TRANSFORMER PRIMARY

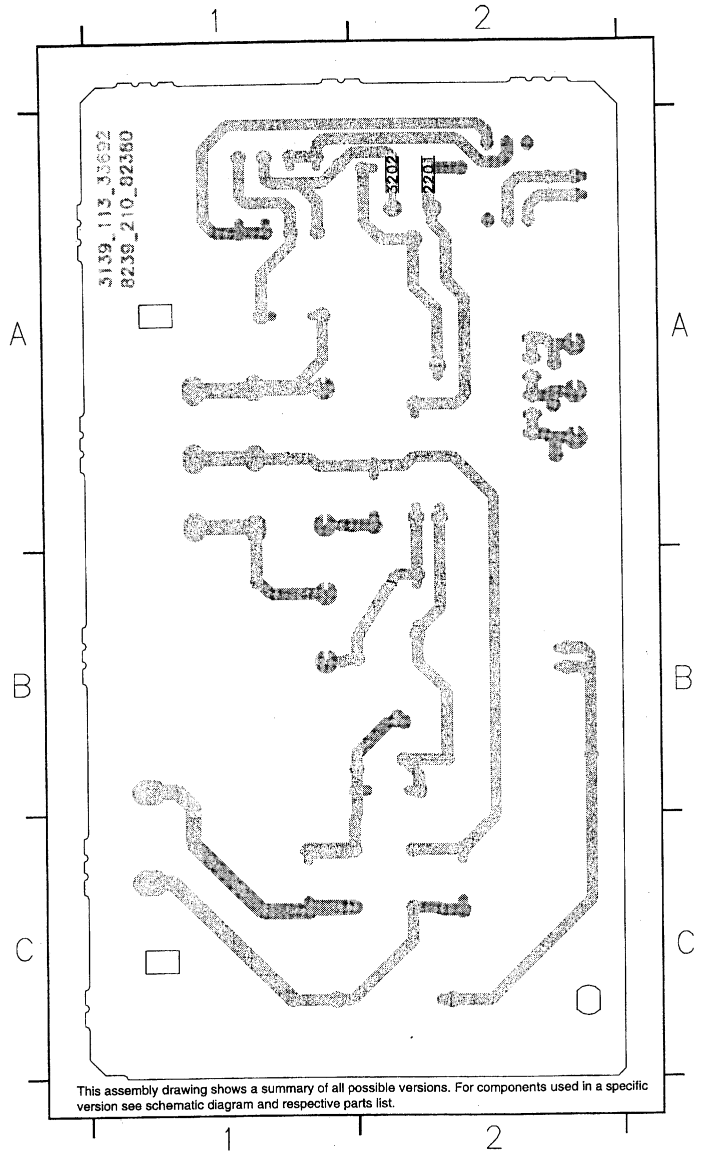
Item	Pos.
21	B1
22	A1
23	A1
1201	C2
1202	A2
1205	B1
3208	C1
5000	B2
5002	B2
5003	A2
5004	A2
5005	A1
5006	A1
5007	A1
5201	A1
5202	C1
6201	A2
6202	A2
6203	A2
6204	A2
7201	A1
7202	A1
9271	C2
9272	C1
9273	B1
9275	A1
9276	A1
9278	A2
9297	B1
9299	A1



1
2
A
B
C
5201
7202
7201
6203
6202
6204
6201
22
220V
9278
5003
C
1202
5007
5006
5005
23
9275
9276
9299
5004
D
5002
B
110V
9297
5000
A
21
IEC, 2A
1205
9273
L
1201
9272
9271
5202
N
3208
8239_210_82380
3139_113_33692
8239_210_82380
mgslpang/mentor/m200cb_18w/3139_113_33692_01

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

Item	Pos.
2201	A2
3202	A2

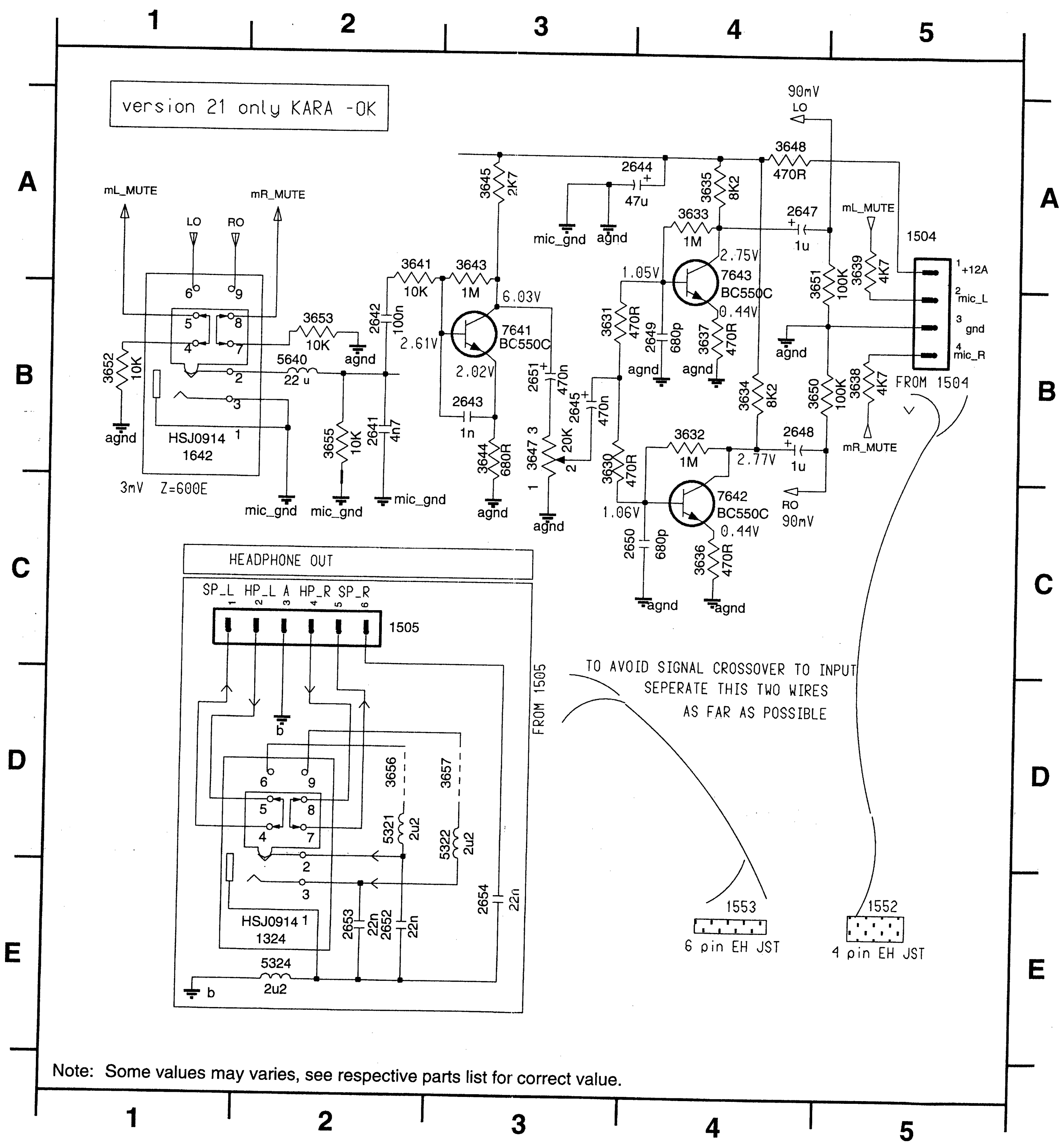


1
2
A
B
C
3139_113_33692
8239_210_82380
3202
2201

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

KARAOKE & HEADPHONE PART - CIRCUIT DIAGRAM

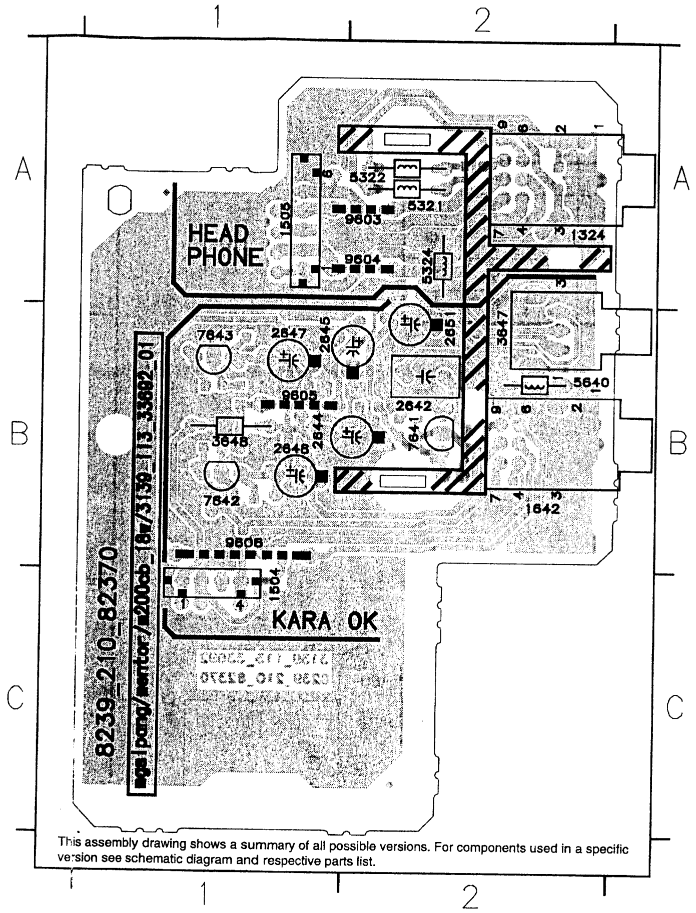
1324	E2
1504	A5
1505	C2
1642	B1
2641	B2
2642	B2
2643	B3
2644	A4
2645	B3
2647	A4
2648	B4
2649	B4
2650	C4
2651	B3
2652	E2
2653	E2
2654	E3
3630	B3
3631	B3
3632	B4
3633	A4
3634	B4
3635	A4
3636	C4
3637	B4
3638	B5
3639	A5
3641	A2
3643	A3
3644	B3
3645	A3
3647	B3
3648	A4
3650	B4
3651	A4
3652	B1
3653	B2
3655	B2
3656	D2
3657	D3
5321	D2
5322	D3
5324	E2
5640	B2
7641	B3
7642	C4
7643	A4


1
2
3
4
5
A
B
C
D
E
version 21 only KARA -OK
mL_MUTE
mR_MUTE
LO
RO
3652 10K
agnd
5640 22 u
3653 10K
agnd
HSJ0914 1
1642
3mV Z=600E
3655 10K
2641 4n7
2642 100n
mic_gnd
3641 10K
3643 1M
3645 2K7
6.03V
2.61V
7641 BC550C
2.02V
2643 1n
3644 680R
2651 470n
2645 470n
3647 20K
2644 47u
3631 470R
2649 680p
1.05V
3633 1M
7643 BC550C
2.75V
0.44V
3635 8K2
3637 470R
3634 8K2
3630 470R
3632 1M
7642 BC550C
1.06V
2.77V
0.44V
2650 680p
3636 470R
90mV
LO
3648 470R
2647 1u
2648 1u
3651 100K
3650 100K
3639 4K7
3638 4K7
1504
+12A
mic_L
gnd
mic_R
FROM 1504
RO
90mV
HEADPHONE OUT
SP_L HP_L A HP_R SP_R
1505
FROM 1505
3656
3657
5321 2u2
5322 2u2
2654 22n
2653 22n
2652 22n
HSJ0914 1
1324
5324 2u2
b
TO AVOID SIGNAL CROSSOVER TO INPUT SEPERATE THIS TWO WIRES AS FAR AS POSSIBLE
1553
6 pin EH JST
1552
4 pin EH JST

Note: Some values may varies, see respective parts list for correct value.

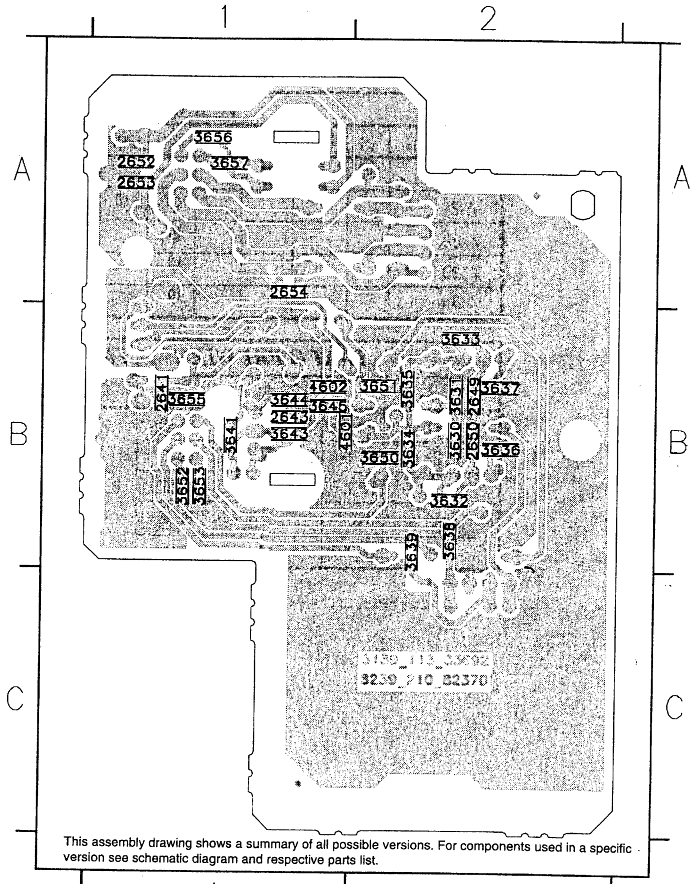
KARAOKE & HEADPHONE PART - COMPONENT & CHIP LAYOUT

1324	A2
1504	C1
1505	A1
1642	B2
2642	B2
2644	B1
2645	B1
2647	B1
2648	B1
2651	B2
3647	B2
3648	B1
5321	A2
5322	A2
5324	A2
5640	B2
7641	B2
7642	B1
7643	B1
9603	A2
9604	A2
9605	B1
9606	B1


1
2
A
B
C
HEAD PHONE
1505
5322
5321
9603
9604
5324
1324
7643
2647
2645
2651
3647
5640
9605
2642
3648
2644
7641
2648
7642
1642
9606
1504
KARA OK
8239_210_82370
3139_113_33692_01

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

2641	B1
2643	B1
2649	B2
2650	B2
2652	A1
2653	A1
2654	A1
3630	B2
3631	B2
3632	B2
3633	B2
3634	B2
3635	B2
3636	B2
3637	B2
3638	B2
3639	B2
3641	B1
3643	B1
3644	B1
3645	B1
3650	B2
3651	B2
3652	B1
3653	B1
3655	B1
3656	A1
3657	A1
4601	B1
4602	B1

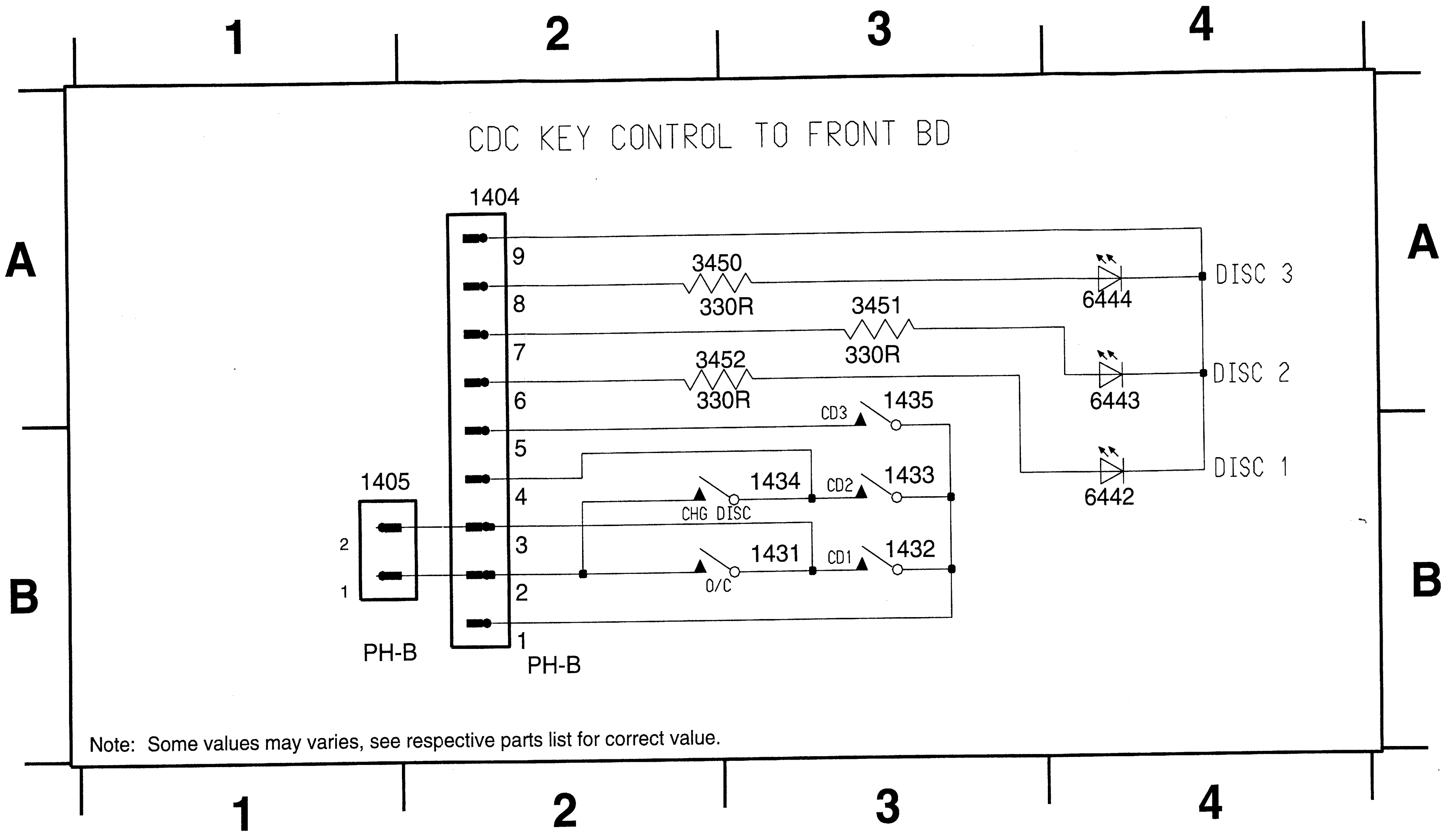

1
2
A
B
C
3656
2652
3657
2653
2654
3633
3652
3655
4602
3651
3644
3645
2643
3643
4601
3641
3650
3634
3631
2650
2649
3636
3637
3632
3639
3638
3635

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

CDC KEY PART

CIRCUIT DIAGRAM - CDC KEY PART

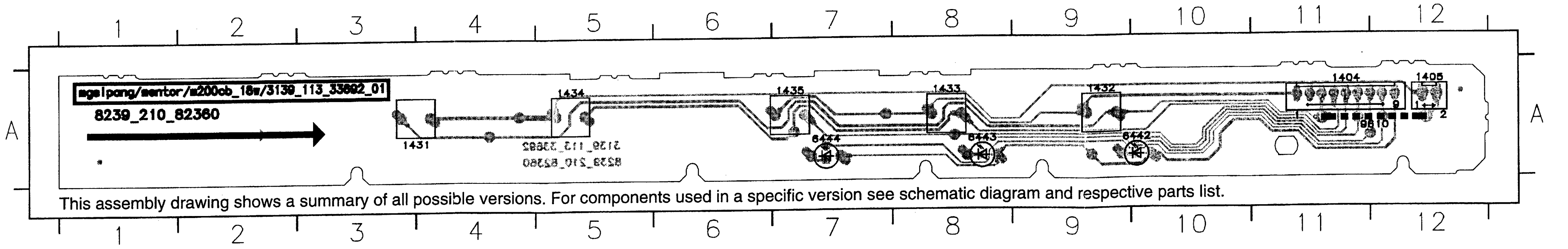
1404 A2	1431 B3	1433 B3	1435 A3	3451 A3	6442 B4	6444 A4
1405 B1	1432 B3	1434 B3	3450 A2	3452 A2	6443 A4	


1
2
3
4
A
B
CDC KEY CONTROL TO FRONT BD
1404
9
8
7
6
5
4
3
2
1
PH-B
1405
2
1
PH-B
3450
330R
3451
330R
3452
330R
6444
6443
6442
DISC 3
DISC 2
DISC 1
CD3
1435
1434
CD2
1433
CHG DISC
1431
CD1
1432
O/C

Note: Some values may varies, see respective parts list for correct value.

COMPONENT LAYOUT - CDC KEY

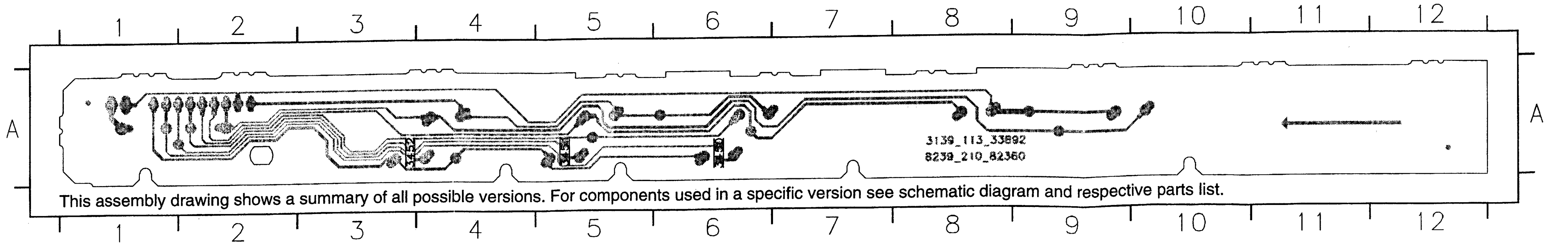
1404 A11 1405 A12 1431 A3 1432 A9 1433 A8 1434 A5 1435 A7 6442 A10 6443 A8 6444 A7 9610 A12


1
2
3
4
5
6
7
8
9
10
11
12
A
agelpang/mentor/m200cb_18m/3139_113_33692_01
8239_210_82360
1431
1434
1435
1433
1432
1404
1405
6444
6443
6442
9610
2

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

CHIP LAYOUT - CDC KEY

3450 A6 3451 A5 3452 A3


1
2
3
4
5
6
7
8
9
10
11
12
A
3139_113_33892
8239_210_82360

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

ELECTRICAL PARTS LIST - COMBI BOARD

MISCELLANEOUS

1201	4822 265 31015	⚠	Mains Socket
1202	4822 272 10269	⚠	Voltage Selector /21/21M
1205	4822 071 52002	⚠	Fuse T2A 250V /21/21M
1206	4822 071 54002	⚠	Fuse T4A 250V
1207	4822 071 55002	⚠	Fuse T5A 250V
1208	4822 071 53151	⚠	Fuse T315mA 250V
1322	4822 267 31176		Loudspeaker Socket
1324	4822 267 40898		Headphone Socket
1431	4822 276 13114		Tact Switch
1507	4822 265 20553		Aux Socket
1508	4822 267 10738		Flex Socket 13 pins
1642	4822 267 40898		Mic-in Socket

CAPACITORS

2220	5322 121 42386	100nF 5% 63V
2221	5322 121 42386	100nF 5% 63V
2222	4822 124 40242	1μF 20% 63V
2223	4822 124 40242	1μF 20% 63V
2224	4822 121 43526	47nF 5% 250V
2225	4822 124 40784	3300μF 20% 16V
2226	4822 124 22263	220μF 20% 25V
2227	4822 124 40255	100μF 20% 63V
2228	4822 124 41751	47μF 20% 50V
2229	5322 121 42386	100nF 5% 63V
2230	4822 122 33177	10nF 20% 50V
2243	4822 124 80563	4700μF 20% 35V
2245	4822 123 14024	1000μF 20% 16V
2321	5322 122 32531	100pF 5% 50V
2322	5322 122 32531	100pF 5% 50V
2323	4822 124 40242	1μF 20% 63V
2324	4822 124 40242	1μF 20% 63V
2327	5322 122 34099	470pF 10% 63V
2328	5322 122 34099	470pF 10% 63V
2331	5322 122 32659	33pF 5% 50V
2332	5322 122 32659	33pF 5% 50V
2333	4822 124 40433	47μF 20% 25V
2334	4822 124 40433	47μF 20% 25V
2335	4822 122 32535	680pF 10% 63V
2336	4822 122 32535	680pF 10% 63V
2337	4822 124 40246	4,7μF 20% 63V
2338	4822 124 40246	4,7μF 20% 63V
2339	4822 124 40433	47μF 20% 25V
2340	5322 126 10223	4,7nF 10% 63V
2341	4822 122 32535	680pF 10% 63V
2342	4822 124 81029	100μF 20% 25V
2343	5322 122 32658	22pF 5% 50V
2344	5322 122 32658	22pF 5% 50V
2345	4822 126 14118	100nF +80/-20% 50V
2346	4822 126 14118	100nF +80/-20% 50V
2347	4822 121 42408	220nF 5% 63V
2348	4822 121 42408	220nF 5% 63V
2349	4822 121 42408	220nF 5% 63V
2350	4822 121 42408	220nF 5% 63V
2353	4822 124 40246	4,7μF 20% 63V
2354	4822 124 40246	4,7μF 20% 63V
2355	4822 122 33175	2,2nF 20% 50V
2356	4822 124 40242	1μF 20% 63V
2357	4822 124 40433	47μF 20% 25V
2358	4822 122 33177	10nF 20% 50V
2359	4822 122 33177	10nF 20% 50V
2360	5322 122 32654	22nF 10% 63V
2361	5322 122 32654	22nF 10% 63V
2362	4822 122 32535	680pF 10% 63V
2363	4822 122 32535	680pF 10% 63V
2364	4822 122 32535	680pF 10% 63V
2365	4822 122 32535	680pF 10% 63V
2366	4822 126 10326	180pF 5% 63V
2367	4822 126 10326	180pF 5% 63V
2400	5322 122 32531	100pF 5% 50V
2401	5322 122 32531	100pF 5% 50V
2402	5322 122 34123	1nF 10% 50V
2403	4822 126 14118	100nF +80/-20% 50V
2405	4822 124 81151	22μF 50V
2501	4822 122 32535	680pF 10% 63V
2502	4822 122 32535	680pF 10% 63V
2503	4822 122 33177	10nF 20% 50V
2504	4822 124 41584	100μF 20% 10V
2505	4822 124 40433	47μF 20% 25V
2506	4822 124 40433	47μF 20% 25V
2507	4822 124 81151	22μF 50V
2508	4822 124 40242	1μF 20% 63V
2509	4822 124 40242	1μF 20% 63V
2510	5322 122 34099	470pF 10% 63V
2511	5322 122 34099	470pF 10% 63V
2512	5322 122 34099	470pF 10% 63V
2513	5322 122 34099	470pF 10% 63V
2514	4822 126 13836	1μF 16V
2515	4822 126 13836	1μF 16V
2516	4822 126 13296	100nF 10% 16V
2517	4822 126 13296	100nF 10% 16V
2518	5322 122 34099	470pF 10% 63V
2519	5322 122 34099	470pF 10% 63V
2520	5322 122 34123	1nF 10% 50V
2521	5322 122 34123	1nF 10% 50V
2522	5322 126 10223	4,7nF 10% 63V
2523	5322 126 10223	4,7nF 10% 63V
2524	5322 122 32531	100pF 5% 50V
2525	5322 122 32531	100pF 5% 50V
2526	4822 126 13296	100nF 10% 16V
2527	4822 126 13296	100nF 10% 16V
2528	4822 126 13296	100nF 10% 16V
2529	4822 126 13296	100nF 10% 16V
2530	4822 126 10326	180pF 5% 63V
2531	4822 126 10326	180pF 5% 63V

ELECTRICAL PARTS LIST - COMBI BOARD

2532	5322 116 80853	560pF 5% 63V
2533	5322 116 80853	560pF 5% 63V
2534	4822 126 13296	100nF 10% 16V
2535	4822 126 13296	100nF 10% 16V
2536	4822 124 80195	470μF 20% 10V
2537	4822 126 13751	47nF 10% 63V
2538	4822 126 13751	47nF 10% 63V
2539	4822 126 13296	100nF 10% 16V
2540	4822 126 13296	100nF 10% 16V
2541	4822 126 13751	47nF 10% 63V
2542	4822 126 13751	47nF 10% 63V
2543	4822 126 13296	100nF 10% 16V
2544	4822 126 13296	100nF 10% 16V
2545	4822 126 13296	100nF 10% 16V
2546	4822 126 13296	100nF 10% 16V
2547	4822 126 13869	470nF +80/-20% 16V
2548	4822 126 13869	470nF +80/-20% 16V
2549	4822 124 40242	1μF 20% 63V
2550	4822 124 40242	1μF 20% 63V
2551	4822 124 40242	1μF 20% 63V
2552	4822 124 40242	1μF 20% 63V
2553	4822 122 33805	330pF 10% 63V
2554	4822 122 33805	330pF 10% 63V
2555	4822 122 33805	330pF 10% 63V
2556	4822 122 33805	330pF 10% 63V
2557	4822 122 33805	330pF 10% 63V
2558	4822 122 33805	330pF 10% 63V
2559	4822 124 40242	1μF 20% 63V
2560	4822 124 40242	1μF 20% 63V
2561	4822 126 13751	47nF 10% 63V
2562	4822 126 14118	100nF +80/-20% 50V
2563	5322 122 32531	100pF 5% 50V
2564	4822 122 33805	330pF 10% 63V
2565	4822 122 33805	330pF 10% 63V
2566	4822 126 10002	100nF 20% 25V
2567	4822 122 33177	10nF 20% 50V
2568	4822 126 13694	68pF 1% 63V
2569	4822 126 13694	68pF 1% 63V
2570	4822 124 41579	10μF 20% 50V
2572	4822 126 10002	100nF 20% 25V
2573	4822 124 40246	4,7μF 20% 63V
2574	4822 124 40246	4,7μF 20% 63V
2575	4822 126 13692	47pF 1% 63V
2576	4822 126 13692	47pF 1% 63V
2577	4822 124 80195	470μF 20% 10V
2578	4822 124 81029	100μF 20% 25V
2579	4822 124 40433	47μF 20% 25V
2580	4822 124 41584	100μF 20% 10V
2581	4822 124 41584	100μF 20% 10V
2582	4822 126 13296	100nF 10% 16V
2583	4822 126 13296	100nF 10% 16V
2584	4822 126 13296	100nF 10% 16V
2585	4822 126 13296	100nF 10% 16V
2586	4822 126 13296	100nF 10% 16V
2587	4822 126 13296	100nF 10% 16V
2590	4822 124 40433	47μF 20% 25V
2591	4822 122 32535	680pF 10% 63V
2592	4822 122 32535	680pF 10% 63V
2594	4822 122 32535	680pF 10% 63V
2595	5322 122 32531	100pF 5% 50V
2596	5322 122 32531	100pF 5% 50V
2641	5322 126 10223	4,7nF 10% 63V
2642	5322 121 42386	100nF 5% 63V
2643	5322 122 34123	1nF 10% 50V
2644	4822 124 40433	47μF 20% 25V
2645	4822 124 41407	0,47μF 20% 63V
2647	4822 124 40242	1μF 20% 63V
2648	4822 124 40242	1μF 20% 63V
2649	4822 122 32535	680pF 10% 63V
2650	4822 122 32535	680pF 10% 63V
2651	4822 124 41407	0,47μF 20% 63V
2652	5322 122 32654	22nF 10% 63V
2653	5322 122 32654	22nF 10% 63V
2654	5322 122 32654	22nF 10% 63V

RESISTORS

3209	4822 051 20478	4R7 5% 0,1W
3210	4822 051 20478	4R7 5% 0,1W
3211	4822 051 20478	4R7 5% 0,1W
3212	4822 051 20109	10R 5% 0,1W
3213	4822 051 10102	1k 2% 0,25W
3214	4822 051 20478	4R7 5% 0,1W
3215	4822 051 20478	4R7 5% 0,1W
3242	4822 051 20478	4R7 5% 0,1W
3243	4822 051 20478	4R7 5% 0,1W
3244	4822 051 20478	4R7 5% 0,1W
3245	4822 051 20478	4R7 5% 0,1W
3246	4822 116 52191	33R 5% 0,5W
3247	4822 051 20339	33R 5% 0,1W
3248	4822 116 52199	68R 5% 0,5W
3249	4822 051 20339	33R 5% 0,1W
3250	4822 116 52199	68R 5% 0,5W
3251	4822 117 10833	10k 1% 0,1W
3252	4822 051 10102	1k 2% 0,25W
3253	4822 051 20109	10R 5% 0,1W
3254	4822 051 20109	10R 5% 0,1W
3255	4822 051 20121	120R 5% 0,1W
3256	4822 116 83864	10k 5% 0,5W
3257	4822 116 83864	10k 5% 0,5W
3258	4822 116 52283	4k7 5% 0,5W
3259	4822 117 10833	10k 1% 0,1W
3260	4822 117 11503	220R 1% 0.1W
3261	4822 117 11383	12k 1% 0,1W
3263	4822 117 11383	12k 1% 0,1W

RESISTORS

3264	4822 116 52289	5k6 5% 0,5W
3265	4822 116 52257	22k 5% 0,5W
3266	4822 116 83872	220R 5% 0,5W
3268	4822 116 83872	220R 5% 0,5W
3269	4822 116 52256	2k2 5% 0,5W
3271	4822 051 10102	1k 2% 0,25W
3272	4822 051 20121	120R 5% 0,1W
3273	4822 051 20339	33R 5% 0,1W
3321	4822 051 20332	3k3 5% 0,1W
3322	4822 051 20332	3k3 5% 0,1W
3325	4822 051 20104	100k 5% 0,1W
3326	4822 051 20104	100k 5% 0,1W
3328	4822 051 20472	4k7 5% 0,1W
3329	4822 051 20332	3k3 5% 0,1W
3330	4822 051 20332	3k3 5% 0,1W
3331	4822 117 11383	12k 1% 0,1W
3332	4822 117 11383	12k 1% 0,1W
3333	4822 051 20472	4k7 5% 0,1W
3334	4822 051 20472	4k7 5% 0,1W
3335	4822 117 11149	82k 1% 0,1W
3336	4822 117 11149	82k 1% 0,1W
3337	4822 051 20479	47R 5% 0,1W
3338	4822 051 20479	47R 5% 0,1W
3339	4822 051 20689	68R 5% 0,1W
3340	4822 051 20689	68R 5% 0,1W
3341	4822 051 10102	1k 2% 0,25W
3342	4822 051 10102	1k 2% 0,25W
3343	4822 051 20154	150k 5% 0,1W
3344	4822 051 20154	150k 5% 0,1W
3345	4822 117 11507	6k8 1% 0,1W
3346	4822 117 11507	6k8 1% 0,1W
3347	4822 117 10833	10k 1% 0,1W
3348	4822 117 10833	10k 1% 0,1W
3349	4822 117 10833	10k 1% 0,1W
3350	4822 117 10833	10k 1% 0,1W
3351	4822 051 20228	2R2 5% 0,1W
3352	4822 051 20228	2R2 5% 0,1W
3353	4822 051 20228	2R2 5% 0,1W
3354	4822 051 20228	2R2 5% 0,1W
3361	4822 116 52249	1k8 5% 0,5W
3362	4822 116 52249	1k8 5% 0,5W
3363	4822 116 52249	1k8 5% 0,5W
3364	4822 116 83883	470R 5% 0,5W
3365	4822 116 83872	220R 5% 0,5W
3366	4822 116 52283	4k7 5% 0,5W
3367	4822 117 10833	10k 1% 0,1W
3368	4822 117 10833	10k 1% 0,1W
3372	4822 051 20109	10R 5% 0,1W
3373	4822 116 52219	330R 5% 0,5W
3378	4822 051 20475	4M7 5% 0,1W
3379	4822 051 20472	4k7 5% 0,1W
3380	4822 051 20392	3k9 5% 0,1W
3381	4822 116 52175	100R 5% 0,5W
3382	4822 051 20153	15k 5% 0,1W
3383	4822 051 20223	22k 5% 0,1W
3384	4822 051 20223	22k 5% 0,1W
3385	4822 117 10834	47k 1% 0,1W
3386	4822 117 10834	47k 1% 0,1W
3387	4822 051 20562	5k6 5% 0,1W
3388	4822 051 20562	5k6 5% 0,1W
3391	4822 051 20105	1M 5% 0,1W
3392	4822 051 20105	1M 5% 0,1W
3400	4822 117 11449	2k2 1% 0,1W
3401	4822 117 11449	2k2 1% 0,1W
3402	4822 117 11449	2k2 1% 0,1W
3403	4822 117 11449	2k2 1% 0,1W
3404	4822 117 11449	2k2 1% 0,1W
3405	4822 051 20471	470R 5% 0,1W
3406	4822 117 11449	2k2 1% 0,1W
3407	4822 117 11449	2k2 1% 0,1W
3409	4822 051 20562	5k6 5% 0,1W
3410	4822 051 20562	5k6 5% 0,1W
3411	4822 116 52175	100R 5% 0,5W
3412	4822 116 52175	100R 5% 0,5W
3413	4822 116 52175	100R 5% 0,5W
3500	4822 052 10339 △	33R 5% 0,33W
3501	4822 117 10834	47k 1% 0,1W
3502	4822 117 10834	47k 1% 0,1W
3503	4822 051 20104	100k 5% 0,1W
3504	4822 051 20104	100k 5% 0,1W
3505	4822 051 20104	100k 5% 0,1W
3506	4822 051 20104	100k 5% 0,1W
3507	4822 051 20683	68k 5% 0,1W
3508	4822 051 20683	68k 5% 0,1W
3509	4822 117 10834	47k 1% 0,1W
3510	4822 117 10834	47k 1% 0,1W
3511	4822 117 10834	47k 1% 0,1W
3512	4822 117 10834	47k 1% 0,1W
3513	4822 117 10834	47k 1% 0,1W
3514	4822 117 10834	47k 1% 0,1W
3515	4822 051 20683	68k 5% 0,1W
3516	4822 051 20683	68k 5% 0,1W
3517	4822 117 10833	10k 1% 0,1W
3518	4822 051 20104	100k 5% 0,1W
3519	4822 051 20104	100k 5% 0,1W
3520	4822 051 20223	22k 5% 0,1W
3521	4822 051 20223	22k 5% 0,1W
3522	4822 051 20105	1M 5% 0,1W
3523	4822 051 20105	1M 5% 0,1W
3524	4822 051 20104	100k 5% 0,1W
3525	4822 051 20104	100k 5% 0,1W
3526	4822 117 11148	56k 1% 0,1W
3527	4822 117 11148	56k 1% 0,1W
3528	4822 051 20333	33k 5% 0,1W

3529	4822 051 20333	33k 5% 0,1W
3530	4822 051 20104	100k 5% 0,1W
3531	4822 051 20104	100k 5% 0,1W
3532	4822 051 20223	22k 5% 0,1W
3533	4822 051 20223	22k 5% 0,1W
3534	4822 051 20154	150k 5% 0,1W
3535	4822 051 20154	150k 5% 0,1W
3536	4822 117 10834	47k 1% 0,1W
3537	4822 117 10834	47k 1% 0,1W
3538	4822 051 20224	220k 5% 0,1W
3539	4822 051 20224	220k 5% 0,1W
3540	4822 051 20474	470k 5% 0,1W
3541	4822 051 20474	470k 5% 0,1W
3542	4822 116 52176	10R 5% 0,5W
3543	4822 051 20104	100k 5% 0,1W
3544	4822 051 20104	100k 5% 0,1W
3545	4822 051 20104	100k 5% 0,1W
3546	4822 051 20104	100k 5% 0,1W
3547	4822 051 20334	330k 5% 0,1W
3548	4822 051 20334	330k 5% 0,1W
3549	4822 051 20104	100k 5% 0,1W
3550	4822 051 20104	100k 5% 0,1W
3551	4822 051 20228	2R2 5% 0,1W
3552	4822 051 20228	2R2 5% 0,1W
3553	4822 117 10834	47k 1% 0,1W
3554	4822 117 10834	47k 1% 0,1W
3556	4822 117 11507	6k8 1% 0,1W
3557	4822 117 11507	6k8 1% 0,1W
3558	4822 051 20225	2M2 5% 0,1W
3559	4822 051 20225	2M2 5% 0,1W
3560	4822 051 20471	470R 5% 0,1W
3561	4822 051 20471	470R 5% 0,1W
3562	4822 051 20153	15k 5% 0,1W
3563	4822 051 20153	15k 5% 0,1W
3564	4822 117 11503	220R 1% 0.1W
3565	4822 117 11503	220R 1% 0.1W
3566	4822 117 11383	12k 1% 0,1W
3567	4822 117 11383	12k 1% 0,1W
3568	4822 051 20153	15k 5% 0,1W
3569	4822 051 20153	15k 5% 0,1W
3570	4822 117 11383	12k 1% 0,1W
3571	4822 117 11383	12k 1% 0,1W
3574	4822 051 20153	15k 5% 0,1W
3575	4822 051 20153	15k 5% 0,1W
3576	4822 051 20223	22k 5% 0,1W
3577	4822 051 20223	22k 5% 0,1W
3579	4822 051 20471	470R 5% 0,1W
3580	4822 051 20223	22k 5% 0,1W
3581	4822 051 20223	22k 5% 0,1W
3582	4822 117 11454	820R 1% 0,1W
3583	4822 117 11454	820R 1% 0,1W
3584	4822 051 10102	1k 2% 0,25W
3585	4822 051 20479	47R 5% 0,1W
3586	4822 117 11449	2k2 1% 0,1W
3587	4822 117 11507	6k8 1% 0,1W
3588	4822 051 20471	470R 5% 0,1W
3589	4822 051 20105	1M 5% 0,1W
3590	4822 051 20105	1M 5% 0,1W
3591	4822 117 10833	10k 1% 0,1W
3592	4822 051 20273	27k 5% 0,1W
3593	4822 051 10102	1k 2% 0,25W
3594	4822 051 10102	1k 2% 0,25W
3595	4822 051 20273	27k 5% 0,1W
3596	4822 051 20683	68k 5% 0,1W
3597	4822 051 20683	68k 5% 0,1W
3598	4822 051 10102	1k 2% 0,25W
3599	4822 051 10102	1k 2% 0,25W
3601	4822 116 83884	47k 5% 0,5W
3602	4822 116 83884	47k 5% 0,5W
3603	4822 051 20105	1M 5% 0,1W
3604	4822 051 20105	1M 5% 0,1W
3605	4822 051 20104	100k 5% 0,1W
3606	4822 051 20104	100k 5% 0,1W
3607	4822 051 20474	470k 5% 0,1W
3608	4822 051 20474	470k 5% 0,1W
3614	4822 116 83864	10k 5% 0,5W
3615	4822 116 83864	10k 5% 0,5W
3616	4822 051 20104	100k 5% 0,1W
3617	4822 117 11139	1k5 1% 0,1W
3618	4822 117 11139	1k5 1% 0,1W
3630	4822 051 20471	470R 5% 0,1W
3631	4822 051 20471	470R 5% 0,1W
3632	4822 051 20105	1M 5% 0,1W
3633	4822 051 20105	1M 5% 0,1W
3634	4822 051 20822	8k2 5% 0,1W
3635	4822 051 20822	8k2 5% 0,1W
3636	4822 051 20471	470R 5% 0,1W
3637	4822 051 20471	470R 5% 0,1W
3638	4822 051 20472	4k7 5% 0,1W
3639	4822 051 20472	4k7 5% 0,1W
3641	4822 117 10833	10k 1% 0,1W
3643	4822 051 20105	1M 5% 0,1W
3644	4822 051 20681	680R 5% 0,1W
3645	4822 117 12955	2K7 1% 0,1W
3647	4822 101 21204	Potm Rotary 20KA
3648	4822 051 20471	470R 5% 0,1W
3650	4822 051 20104	100k 5% 0,1W
3651	4822 051 20104	100k 5% 0,1W
3652	4822 117 10833	10k 1% 0,1W
3653	4822 117 10833	10k 1% 0,1W
3655	4822 117 10833	10k 1% 0,1W
3656	4822 051 20008	0R Jumper 0805
3657	4822 051 20008	0R Jumper 0805
4200	4822 051 20008	0R Jumper 0805

RESISTORS

4201	4822 051 20008	0R Jumper 0805
4202	4822 051 20008	0R Jumper 0805
4203	4822 051 20008	0R Jumper 0805
4205	4822 051 20008	0R Jumper 0805
4206	4822 051 20008	0R Jumper 0805
4207	4822 051 20008	0R Jumper 0805
4208	4822 051 20008	0R Jumper 0805
4209	4822 051 20008	0R Jumper 0805
4210	4822 051 20008	0R Jumper 0805
4211	4822 051 20008	0R Jumper 0805
4212	4822 051 20008	0R Jumper 0805
4213	4822 051 20008	0R Jumper 0805
4214	4822 051 20008	0R Jumper 0805
4215	4822 051 20008	0R Jumper 0805
4216	4822 051 20008	0R Jumper 0805
4217	4822 051 20008	0R Jumper 0805
4218	4822 051 20008	0R Jumper 0805
4219	4822 051 20008	0R Jumper 0805
4220	4822 051 20008	0R Jumper 0805
4244	4822 051 20008	0R Jumper 0805
4500	4822 051 20008	0R Jumper 0805
4502	4822 051 20008	0R Jumper 0805
4503	4822 051 20008	0R Jumper 0805
4507	4822 051 20008	0R Jumper 0805
4508	4822 051 20008	0R Jumper 0805
4509	4822 051 20008	0R Jumper 0805
4510	4822 051 20008	0R Jumper 0805
4511	4822 051 20008	0R Jumper 0805
4512	4822 051 20008	0R Jumper 0805
4513	4822 051 20008	0R Jumper 0805
4514	4822 051 20008	0R Jumper 0805
4515	4822 051 20008	0R Jumper 0805
4516	4822 051 20008	0R Jumper 0805
4517	4822 051 20008	0R Jumper 0805
4518	4822 051 20008	0R Jumper 0805
4519	4822 051 20008	0R Jumper 0805
4520	4822 051 20008	0R Jumper 0805
4521	4822 051 20008	0R Jumper 0805
4522	4822 051 20008	0R Jumper 0805
4523	4822 051 20008	0R Jumper 0805
4524	4822 051 20008	0R Jumper 0805
4525	4822 051 20008	0R Jumper 0805
4526	4822 051 20008	0R Jumper 0805
4527	4822 051 20008	0R Jumper 0805
4528	4822 051 20008	0R Jumper 0805
4529	4822 051 20008	0R Jumper 0805
4530	4822 051 20008	0R Jumper 0805
4531	4822 051 20008	0R Jumper 0805
4532	4822 051 20008	0R Jumper 0805
4534	4822 051 20008	0R Jumper 0805
4535	4822 051 20008	0R Jumper 0805
4536	4822 051 20008	0R Jumper 0805
4537	4822 051 20008	0R Jumper 0805
4539	4822 051 20008	0R Jumper 0805
4540	4822 051 20008	0R Jumper 0805
4541	4822 051 20008	0R Jumper 0805
4543	4822 051 20008	0R Jumper 0805
4544	4822 051 20008	0R Jumper 0805
4545	4822 051 20008	0R Jumper 0805
4546	4822 051 20008	0R Jumper 0805
4547	4822 051 20008	0R Jumper 0805
4549	4822 051 20008	0R Jumper 0805
4550	4822 051 20008	0R Jumper 0805
4551	4822 051 20008	0R Jumper 0805
4554	4822 051 20008	0R Jumper 0805
4555	4822 051 20008	0R Jumper 0805
4556	4822 051 20008	0R Jumper 0805
4557	4822 051 20008	0R Jumper 0805
4558	4822 051 20008	0R Jumper 0805
4559	4822 051 20008	0R Jumper 0805
4561	4822 051 20008	0R Jumper 0805
4562	4822 051 20008	0R Jumper 0805
4563	4822 051 20008	0R Jumper 0805
4564	4822 051 20008	0R Jumper 0805
4565	4822 051 20008	0R Jumper 0805
4566	4822 051 20008	0R Jumper 0805
4568	4822 051 20008	0R Jumper 0805
4569	4822 051 20008	0R Jumper 0805
4570	4822 051 20008	0R Jumper 0805
4571	4822 051 20008	0R Jumper 0805
4572	4822 051 20008	0R Jumper 0805
4573	4822 051 20008	0R Jumper 0805
4601	4822 051 20008	0R Jumper 0805
4602	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5202	4822 157 71285	Choke Coil 400µH 30%
5321	4822 157 11477	Coil 2,2µH 5%
5322	4822 157 11477	Coil 2,2µH 5%
5324	4822 157 11477	Coil 2,2µH 5%
5501	4822 157 11477	Coil 2,2µH 5%
5502	4822 157 11477	Coil 2,2µH 5%
5503	4822 157 62255	Coil 18,5 Turns
5504	4822 157 62255	Coil 18,5 Turns
5505	4822 157 62255	Coil 18,5 Turns
5506	4822 157 62255	Coil 18,5 Turns
5507	4822 156 21721	Coil 2,2µH 10%
5508	4822 157 53447	Ind. Bead EMI 100MHz
5640	4822 157 11526	Coil 22µH 5%

DIODES

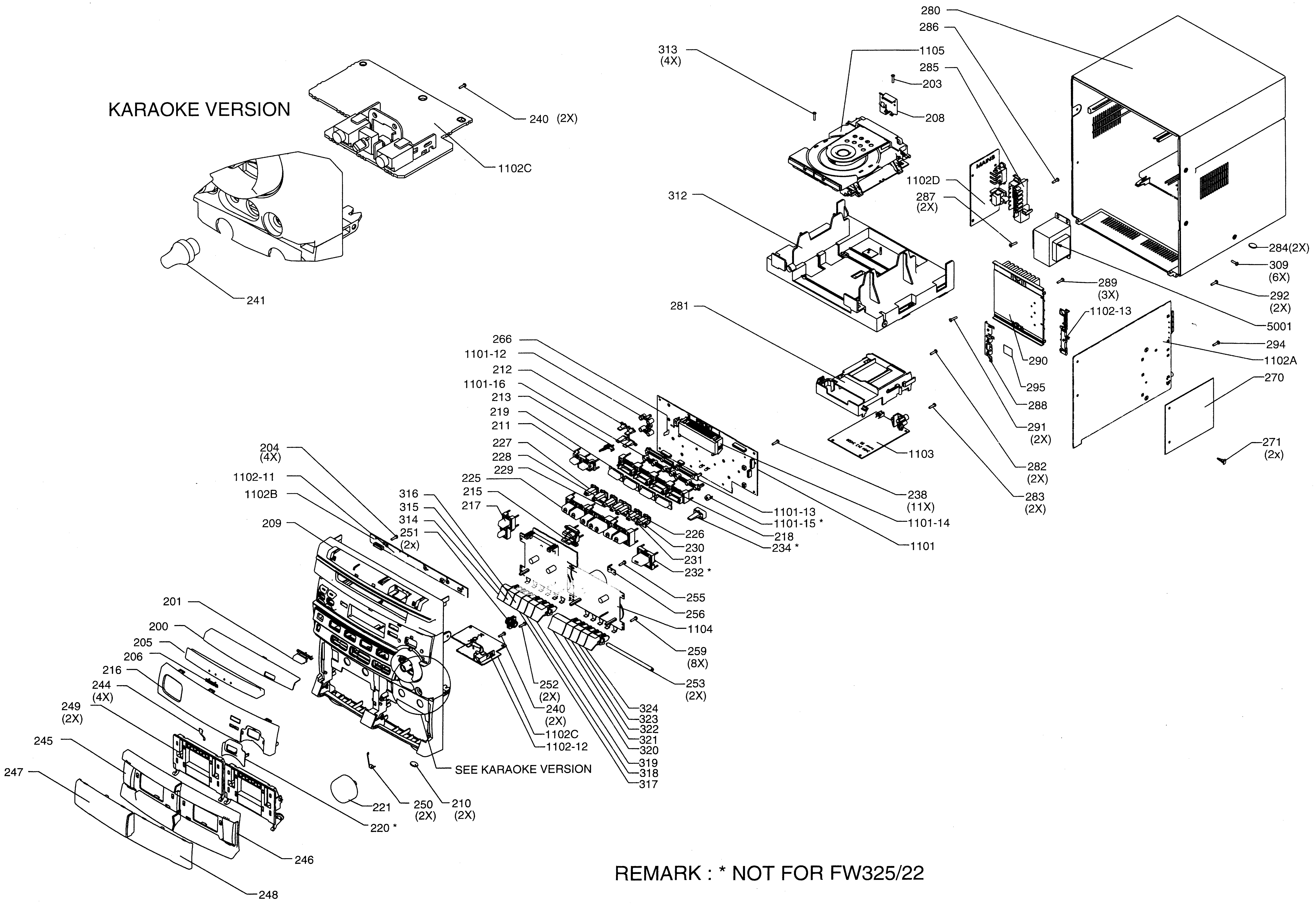
6220	4822 130 31878	1N4003G
6221	4822 130 31878	1N4003G
6222	4822 130 31878	1N4003G
6223	4822 130 31878	1N4003G
6224	4822 130 31878	1N4003G
6225	4822 130 31878	1N4003G
6226	4822 130 31878	1N4003G
6227	4822 130 31878	1N4003G
6228	4822 130 34173	BZX79-B5V6
6229	4822 130 34379	BZX79-B27
6230	4822 130 31878	1N4003G
6231	4822 130 34174	BZX79-B4V7
6232	4822 130 30621	1N4148
6233	4822 130 30621	1N4148
6235	4822 130 30621	1N4148
6236	4822 130 34233	BZX79-B5V1
6237	4822 130 34233	BZX79-B5V1
6240	4822 130 31878	1N4003G
6241	4822 130 31878	1N4003G
6242	4822 130 31878	1N4003G
6243	4822 130 31878	1N4003G
6244	4822 130 31878	1N4003G
6245	4822 130 31878	1N4003G
6248	4822 130 31878	1N4003G
6249	4822 130 31878	1N4003G
6250	4822 130 31878	1N4003G
6251	4822 130 31878	1N4003G
6255	4822 130 31878	1N4003G
6321	4822 130 31878	1N4003G
6322	4822 130 31878	1N4003G
6323	4822 130 31878	1N4003G
6324	4822 130 31878	1N4003G
6325	4822 130 34281	BZX79-B15
6326	4822 130 31024	BZX79-B18
6327	5322 130 31504	BZX79-B3V3
6328	4822 130 31878	1N4003G
6329	4822 130 30621	1N4148
6330	4822 130 30621	1N4148
6502	4822 130 34173	BZX79-B5V6
6549	4822 130 30621	1N4148
6550	4822 130 30621	1N4148
6551	4822 130 34173	BZX79-B5V6
6552	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7241	4822 130 40959	BC547B
7242	5322 130 44593	BC369
7243	4822 130 40959	BC547B
7244	4822 130 40959	BC547B
7245	4822 130 40959	BC547B
7246	4822 130 40981	BC337-25
7247	4822 130 40981	BC337-25
7248	4822 130 40981	BC337-25
7249	4822 130 41246	BC327-25
7250	4822 209 33575	L7812CP
7320	4822 130 42615	BC817-40
7321	4822 130 42615	BC817-40
7322	4822 130 42615	BC817-40
7323	4822 130 42615	BC817-40
7329	4822 130 10847	BDW94C
7330	4822 130 40959	BC547B
7331	5322 130 60508	BC857B
7332	5322 130 60508	BC857B
7333	4822 130 42615	BC817-40
7391	4822 209 16224	AN7125
7400	5322 130 60508	BC857B
7401	4822 130 40981	BC337-25
7402	5322 209 11306	HEF4094BT
7501	5322 209 11102	HEF4052BT
7503	4822 130 41096	BC550C
7504	4822 130 41096	BC550C
7505	4822 130 44568	ON4986
7506	4822 130 44568	ON4986
7507	4822 130 44568	ON4986
7508	4822 130 44568	ON4986
7530	5322 209 14482	HEF4069UBT
7537	4822 130 60511	BC847B
7538	4822 130 60511	BC847B
7539	4822 130 60511	BC847B
7540	4822 130 60511	BC847B
7541	4822 130 60511	BC847B
7542	4822 130 60511	BC847B
7543	4822 130 60511	BC847B
7544	4822 130 60511	BC847B
7545	5322 130 60508	BC857B
7546	5322 130 60508	BC857B
7547	4822 130 60511	BC847B
7548	4822 130 60511	BC847B
7549	4822 130 60511	BC847B
7550	4822 130 60511	BC847B
7554	4822 209 31378	NJM4556MB
7556	5322 130 60508	BC857B
7641	4822 130 41096	BC550C
7642	4822 130 41096	BC550C
7643	4822 130 41096	BC550C

Note: Only the parts mentioned in this list are normal service spare parts.

EXPLODED VIEW


KARAOKE VERSION
240 (2X)
1102C
241
313 (4X)
1105
203
208
280
286
285
1102D
287 (2X)
312
284(2X)
309 (6X)
292 (2X)
289 (3X)
1102-13
5001
294
1102A
290
295
288
270
281
266
1101-12
212
1101-16
213
219
211
227
228
229
225
215
217
1103
291 (2X)
282 (2X)
283 (2X)
271 (2x)
238 (11X)
1101-13
1101-15 *
1101-14
218
234 *
1101
226
230
231
232 *
255
256
1104
259 (8X)
253 (2X)
204 (4X)
1102-11
1102B
209
316
315
314
251 (2x)
201
200
205
206
216
244 (4X)
249 (2X)
245
247
252 (2X)
240 (2X)
1102C
1102-12
324
323
322
321
320
319
318
317
SEE KARAOKE VERSION
221
250 (2X)
210 (2X)
220 *
246
248

REMARK : * NOT FOR FW325/22

MECHANICAL & ACCESSORIES PARTS LIST - MAIN UNIT

200	4822 450 10499	Window SL Control
201	4822 410 11803	Button Open/Close
205	4822 442 01357	Cover Tray SL
206	4822 454 13035	Badge Philips
209	4822 459 04974	Cabinet Front FW326/21/21M
209	4822 459 04984	Cabinet Front FW326/22/34
209	4822 459 04983	Cabinet Front FW325/22
210	4822 462 40683	Plate (Foot)
211	4822 410 11636	Button Set DSC/DBB
215	4822 410 11657	Button Set CLK/RDS
216	4822 450 10501	Window Disp. FW326/21/21M
216	4822 450 10511	Window Disp. FW326/22/34
216	4822 450 10509	Window Disp. FW325/22
217	4822 410 11638	Button Set Power/HSD
218	4822 410 11643	Button Source Select
220	4822 442 01268	Cover Incredible Sound FW326
221	4822 410 11727	Knob Volume Rotary
225	4822 410 11729	Button Set Controls
232	4822 410 11705	Button Incredible Sound FW326
241	4822 410 11728	Knob Karaoke /21/21M
244	4822 492 70231	Spring Leaf
245	4822 442 01224	Cover Door Cassette Left
246	4822 442 01225	Cover Door Cassette Right
247	4822 381 11935	Lens Cassette Left
247	4822 450 10542	Lens Cassette Left /34
248	4822 381 11936	Lens Cassette Right
248	4822 450 10543	Lens Cassette Right /34
249	4822 443 10881	Door Cassette
250	4822 492 42709	Spring-Door
251	4822 529 10322	Damper Assembly
271	4822 466 93148	Spacer 5mm
280	4822 426 10598	Cabinet Rear /21
280	4822 426 10605	Cabinet Rear /21M/34
280	4822 426 10636	Cabinet Rear /22
284	4822 462 40683	Plate (Foot)
314	4822 410 11656	Button Record 1
315	4822 410 11658	Button Play 1
316	4822 410 11659	Button Rewind 1
317	4822 410 11661	Button F. Forward 1
318	4822 410 11662	Button Stop/Eject 1
319	4822 410 11663	Button Pause 1
320	4822 410 11664	Button Play 2
321	4822 410 11665	Button Rewind 2
322	4822 410 11666	Button F. Forward 2
323	4822 410 11667	Button Stop/Eject 2
324	4822 410 11668	Button Pause 2
350	4822 445 10747	Left Loudspeaker
350	4822 240 10286	Left Loudspeaker /22
350	4822 445 10748	Right Loudspeaker
350	4822 240 10287	Right Loudspeaker /22
351	4822 303 50063	FM Aerial
356	4822 219 10483	RC0797/01 for FW326
356	4822 219 10502	RC0798/01 for FW325
384	4822 303 50082	AM Frame Aerial
385	4822 321 10249	⚠ Mains Cord
387	4822 736 16088	Instruction for Use /21/21M
387	4822 736 16114	Instruction For Use /22
387	4822 736 16229	Instruction For Use /34
1456	4822 320 12246	Flex Cable 13pin 22cm
5001	4822 146 10951	⚠ Transformer Mains /21/21M
5001	4822 146 10949	⚠ Transformer Mains /22/34

LOUDSPEAKER BOX BREAKDOWN

4822 240 10307	Woofer 6R 5,25"
4822 240 10306	Tweeter 6R 2,5"
4822 458 10643	Cloth Frame Right /21/21M/34
4822 458 10644	Cloth Frame Left /21/21M/34

Note: Only the parts mentioned in this list are normal service spare parts.

SCREW LISTS - MAIN UNIT

203	D3 x 12
204	D3 x 12
238	D3 x 12
240	D3 x 12
252	D3 x 12
255	D3 x 12
259	D3 x 12
282	D3 x 12
283	D3 x 12
286	D3 x 12
287	D3 x 16
289	M3 x 15
291	D3 x 16
292	D3 x 12
294	D3 x 12
309	D3 x 12
313	D3 x 12

FW325 & FW326

A98 - 162

Service
Service
Service

Product Service Group CE Audio

Service Information

Already published Service Informations:

CORRECTIONS TO SERVICE MANUAL

* Page 1-2 : FW326/34 should be with RDS feature.

* Page 12-2 : The correct service code for FW326/34 should be:

350	4822 445 10765	Loudspeaker Box
-	4822 458 10645	Cloth Frame Assembly

* Correction of circuit diagram and/or parts list for **FRONT BOARD:**

2412	4822 126 14118	100nF +80/-20% 50V
2414	4822 126 14118	100nF +80/-20% 50V
2415	4822 126 14118	100nF +80/-20% 50V
2422	4822 126 14118	100nF +80/-20% 50V
2425	4822 126 14118	100nF +80/-20% 50V
2439	4822 126 14118	100nF +80/-20% 50V

* Correction of circuit diagram and/or parts list for **COMBI BOARD:**

2335	5322 126 10184	680pF 5% 50V
2336	5322 126 10184	680pF 5% 50V
2501	5322 122 34099	470pF 10% 63V
2502	5322 122 34099	470pF 10% 63V
2566	4822 126 14118	100nF +80/-20% 50V
2572	4822 126 14118	100nF +80/-20% 50V
2595	5322 122 32531	100pF 5% 50V for /21/21M
2596	5322 122 32531	100pF 5% 50V for /21/21M
3648	4822 116 83883	470R 5% 0,5W
5507	4822 157 11477	Coil 2,2µH 5%

ADDITIONS TO SERVICE MANUAL

* For practical reason the existing individual service codes for the Tape Deck buttons will be replaced by 2 separate set of buttons as given below.

Pos 314 - 319	4822 410 12125	Rec/PB button set
Pos 320 - 324	4822 410 12126	Playback button set

CHANGES DURING PRODUCTION

MAIN UNIT

* From production week 9821 new Lens Cassette are introduced with moulded-in texture, the new codes are:

247	4822 450 10542	Lens Cassette Left
248	4822 450 10543	Lens Cassette Right

FRONT BOARD

* From production week 9827 onwards layout stage .3 is implemented to improve EMC performance.

Add	2417	220µF 20% 10V	4822 124 12245
	2446^	1,8nF 10% 63V	4822 126 10847
	5404^	Coil 2,2µH 5%	4822 157 11477
Change	2422 to	220nF 20% 25V	4822 126 13061
	2444^ to	8,2nF 10% 63V	4822 126 10525
	3485 to	1k 2% 0,25W	4822 051 10102
Delete	2432^		

Note: ^ - For RDS version only
New drawings are enclosed.

COMBI BOARD

* From production week 9823 onwards the undermentioned components are change to improve channel separation.

Change	3391 to	10M 5% 0,1W	4822 051 20106
	3392 to	10M 5% 0,1W	4822 051 20106

* From production week 9823 onwards the undermentioned components are change to reduce THD distortion in CD mode.

Change	3321 to 10R 5% 0,1W	4822 051 20109
	3322 to 10R 5% 0,1W	4822 051 20109
	3501 to 82k 1% 0,1W	4822 117 11149
	3502 to 82k 1% 0,1W	4822 117 11149
	3556 to 3k9 5% 0,1W	4822 051 20392
	3557 to 3k9 5% 0,1W	4822 051 20392
	3558 to 1M 5% 0,1W	4822 051 20105
	3559 to 1M 5% 0,1W	4822 051 20105
	3574 to 22k 5% 0,1W	4822 051 20223
	3614 to 100R 5% 0,5W	4822 116 52175
	3615 to 100R 5% 0,5W	4822 116 52175

* From production week 9827 onwards layout stage .3 is implemented to improve EMC, ESD, grounding noise performance and wire connectors cost saving.

Add	9554 and 9555	Bare wires
Change	3259 to 15k 5% 0,1W	4822 051 20153
Delete	2321 and 2322	
	4200 - 4203, 4205 - 4219, 4504, 4506 and 4507	

New drawings are enclosed.

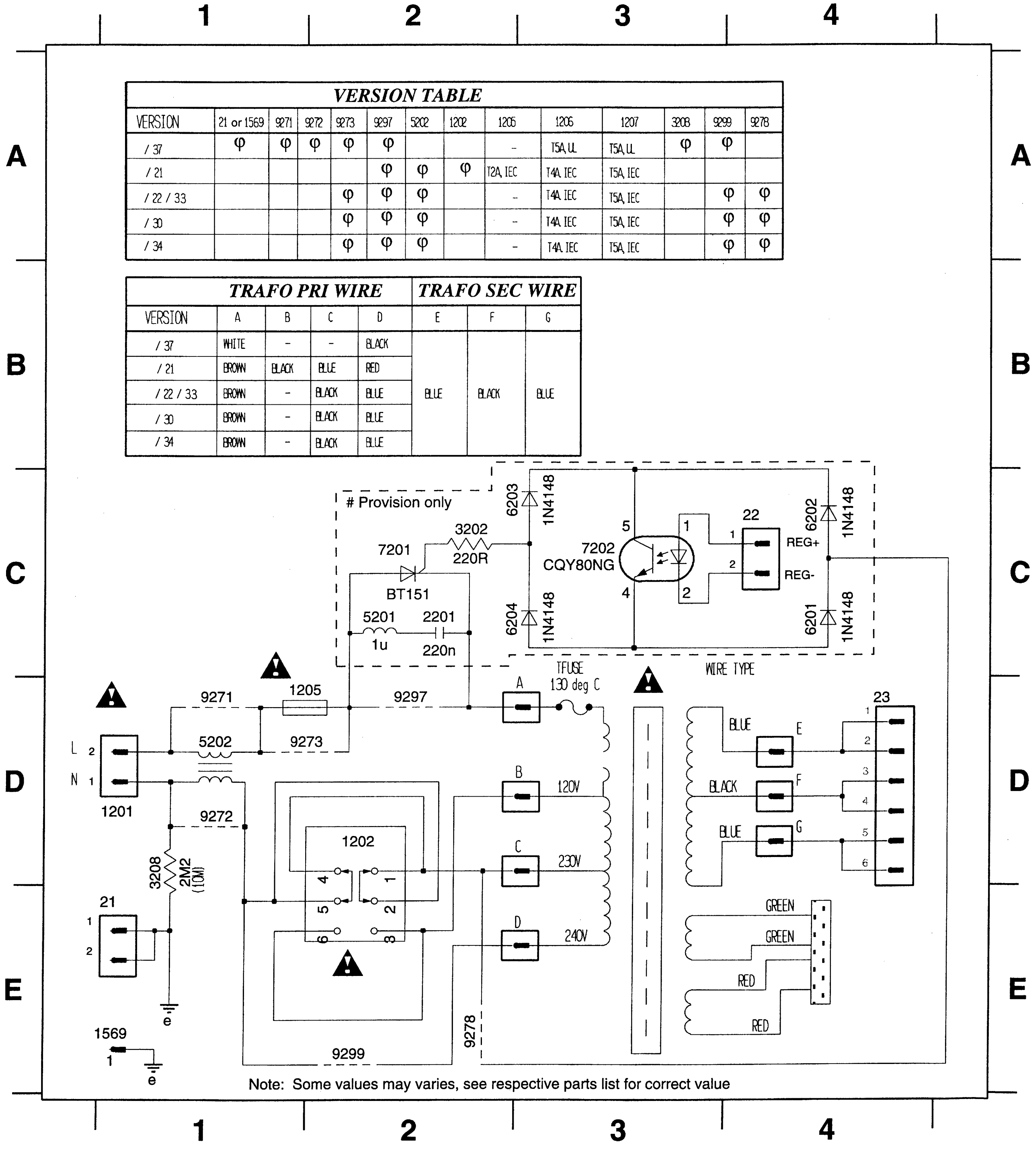
MTF TAPE MODULE

* From production week 9828 onwards, transistor 7702 is changed to 4822 130 40981 BC337-25 due to standardization with other application.

* From production week 9833 onwards, resistor 3787 is changed to 4822 116 52219 330R 5% 0,5W to improve poor frequency response of record playback due to spread of Erase head.

COMBI BOARD - TRANSFORMER PRIMARY PART
CIRCUIT DIAGRAM

21	E1
22	C4
23	D4
1201	D1
1202	D2
1205	D1
1569	E1
2201	C2
3202	C2
3208	D1
5201	C2
5202	D1
6201	C4
6202	C4
6203	C3
6204	C3
7201	C2
7202	C3
9271	D1
9272	D1
9273	D1
9278	E2
9297	D2
9299	E2


1
2
3
4
A
B
C
D
E
# Provision only
3202
220R
7201
BT151
5201
1u
2201
220n
6203
1N4148
6204
1N4148
5
4
1
2
7202
CQY80NG
22
1
2
REG+
REG-
6202
1N4148
6201
1N4148
9271
1205
9297
5202
9273
L 2
N 1
1201
9272
3208
2M2
(10M)
21
1
2
1569
1
e
A
TFUSE
130 deg C
B
120V
C
230V
D
240V
1202
4
1
5
2
6
3
9299
9278
WIRE TYPE
BLUE
E
BLACK
F
BLUE
G
23
1
2
3
4
5
6
GREEN
GREEN
RED
RED

VERSION TABLE

VERSION	21 or 1569	9271	9272	9273	9297	5202	1202	1205	1206	1207	3208	9299	9278
/ 37	φ	φ	φ	φ	φ			-	T5A, UL	T5A, UL	φ	φ	
/ 21					φ	φ	φ	T2A, IEC	T4A, IEC	T5A, IEC			
/ 22 / 33				φ	φ	φ		-	T4A, IEC	T5A, IEC		φ	φ
/ 30				φ	φ	φ		-	T4A, IEC	T5A, IEC		φ	φ
/ 34				φ	φ	φ		-	T4A, IEC	T5A, IEC		φ	φ

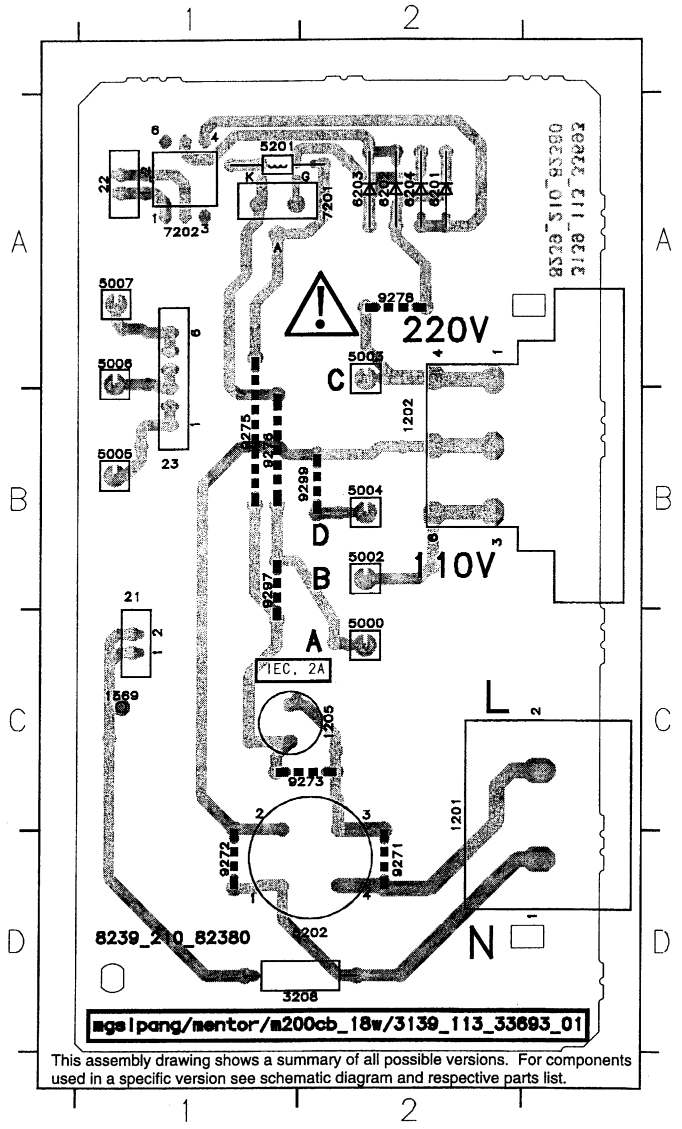
	TRAFO PRI WIRE				TRAFO SEC WIRE		
VERSION	A	B	C	D	E	F	G
/ 37	WHITE	-	-	BLACK	BLUE	BLACK	BLUE
/ 21	BROWN	BLACK	BLUE	RED			
/ 22 / 33	BROWN	-	BLACK	BLUE			
/ 30	BROWN	-	BLACK	BLUE			
/ 34	BROWN	-	BLACK	BLUE			

Note: Some values may varies, see respective parts list for correct value

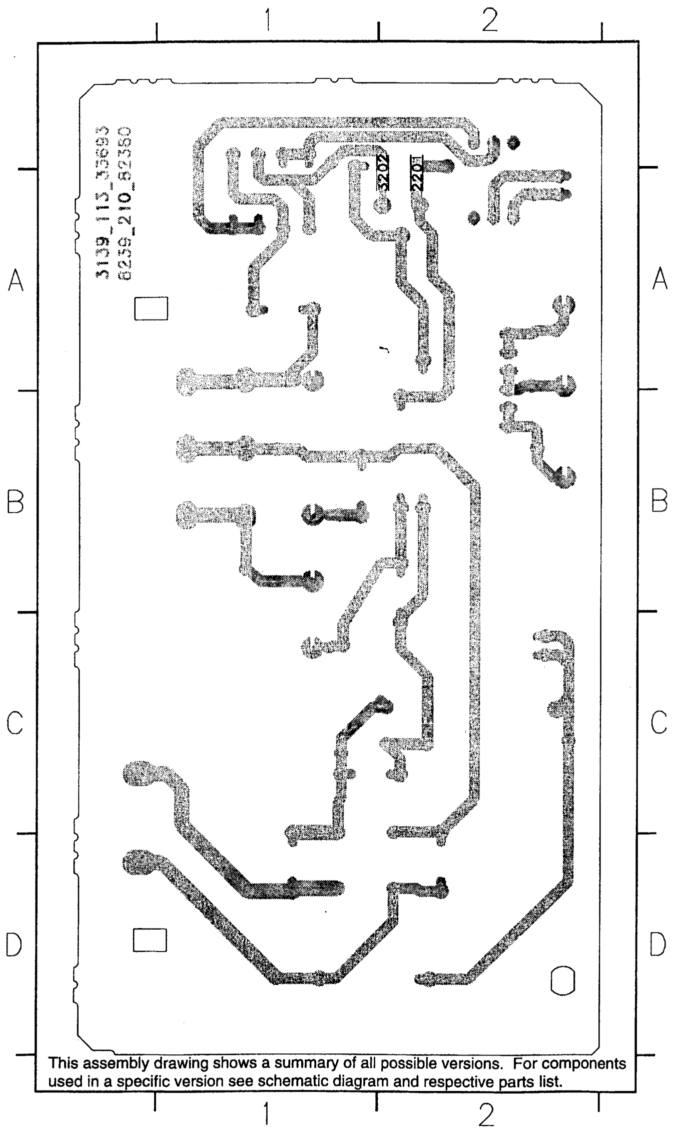
COMBI BOARD - TRANSFORMER PRIMARY PART
OMPONENT & CHIP LAYOUT

21	B1
22	A1
23	B1
1201	C2
1202	B2
1205	C2
1569	C1
3208	D2
5000	C2
5002	B2
5003	A2
5004	B2
5005	B1
5006	A1
5007	A1
5201	A1
5202	D2
6201	A2
6202	A2
6203	A2
6204	A2
7201	A2
7202	A1
9271	D2
9272	D1
9273	C2
9275	B1
9276	B1
9278	A2
9297	B1
9299	B2

2201	A2
3202	A2


1
2
A
B
C
D
22
7202
5201
6203
6204
6201
7201
8239_210_82380
3139_113_33693
5007
5006
5005
23
9278
220V
5003
C
1202
9275
9276
9299
5004
D
5002
B
110V
9297
A
5000
21
1569
IEC 2A
1205
9273
L
9272
9271
1201
3208
N
8239_210_82380
mgslpang/mentor/m200cb_18w/3139_113_33693_01

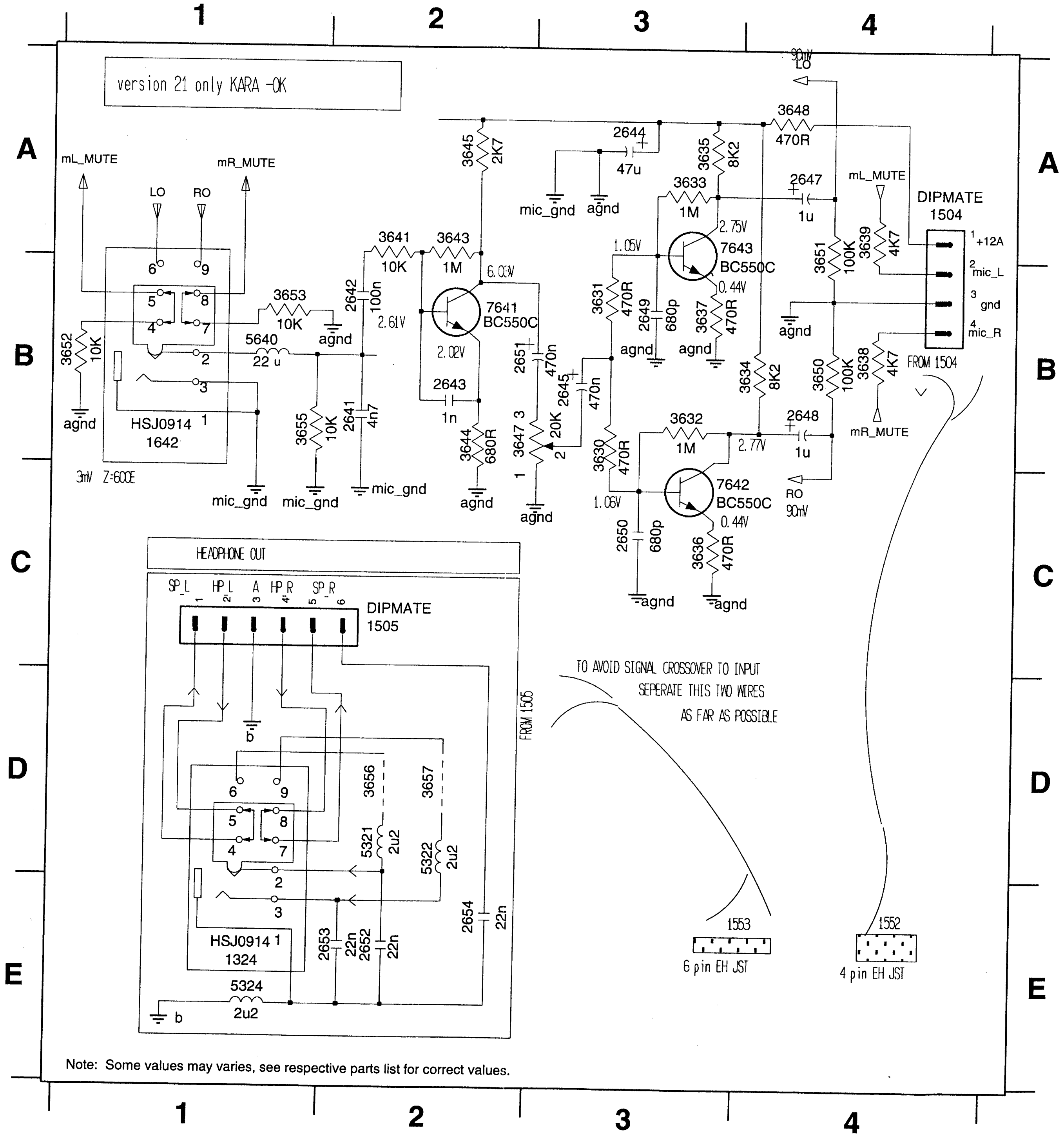
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.


1
2
A
B
C
D
3139_113_33693
8239_210_82380
3202
2201

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

COMBI BOARD - KARAOKE & HEADPHONE PART
CIRCUIT DIAGRAM

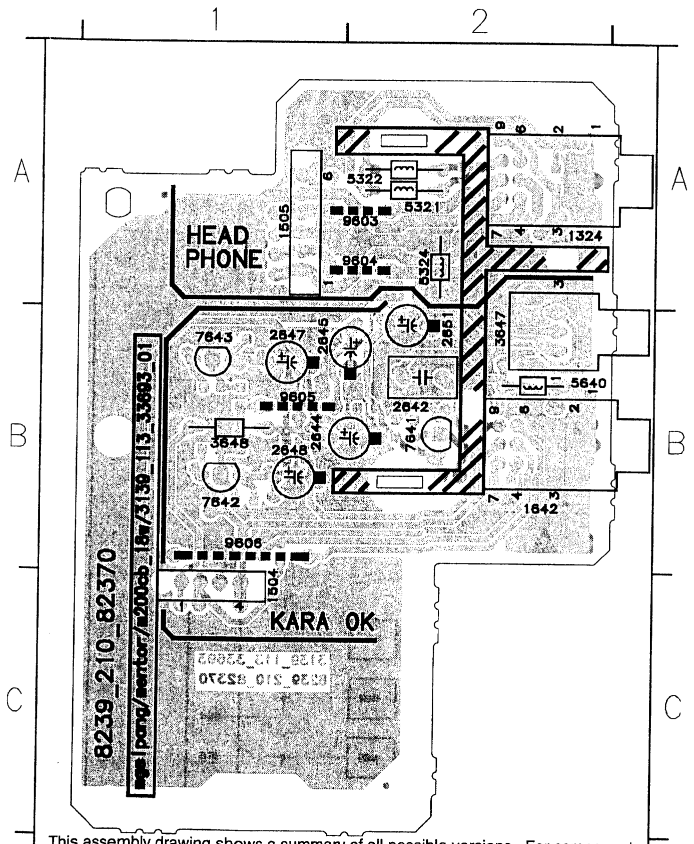
1324 E1	2641 B2	2645 B3	2650 C3	2654 E2	3633 A3	3637 B3	3643 A2	3648 A4	3653 B1	5321 D2	7641 B2
1504 A4	2642 B2	2647 A4	2651 B2	3630 B3	3634 B4	3638 B4	3644 B2	3650 B4	3655 B1	5322 D2	7642 C3
1505 C2	2643 B2	2648 B4	2652 E2	3631 B3	3635 A3	3639 A4	3645 A2	3651 A4	3656 D2	5324 E1	7643 A3
1642 B1	2644 A3	2649 B3	2653 E2	3632 B3	3636 C3	3641 A2	3647 B2	3652 B1	3657 D2	5640 B1	


version 21 only KARA -OK
mL_MUTE
mR_MUTE
LO
RO
HSJ0914
1642
3mV Z=600E
3652 10K
5640 22 u
3653 10K
3655 10K
2641 4n7
2642 100n
3641 10K
3643 1M
7641 BC550C
6.03V
2.61V
2.02V
2643 1n
3644 680R
3645 2K7
2644 47u
2651 470n
2645 470n
3647 20K
3633 1M
7643 BC550C
2.75V
0.44V
1.05V
3631 470R
2649 680p
3637 470R
3635 8K2
3648 470R
90mV
2647 1u
3651 100K
3639 4K7
DIPMATE
1504
+12A
mic_L
gnd
mic_R
FROM 1504
3634 8K2
3650 100K
3638 4K7
2648 1u
3632 1M
2.77V
7642 BC550C
1.06V
3630 470R
2650 680p
3636 470R
mic_gnd
agnd
HEADPHONE OUT
SP L
HP L
A
HP R
SP R
DIPMATE
1505
3656
3657
5321 2u2
5322 2u2
2653 22n
2652 22n
2654 22n
HSJ0914
1324
5324 2u2
TO AVOID SIGNAL CROSSOVER TO INPUT SEPERATE THIS TWO WIRES AS FAR AS POSSIBLE
FROM 1505
1553
6 pin EH JST
1552
4 pin EH JST
1
2
3
4
A
B
C
D
E

Note: Some values may varies, see respective parts list for correct values.

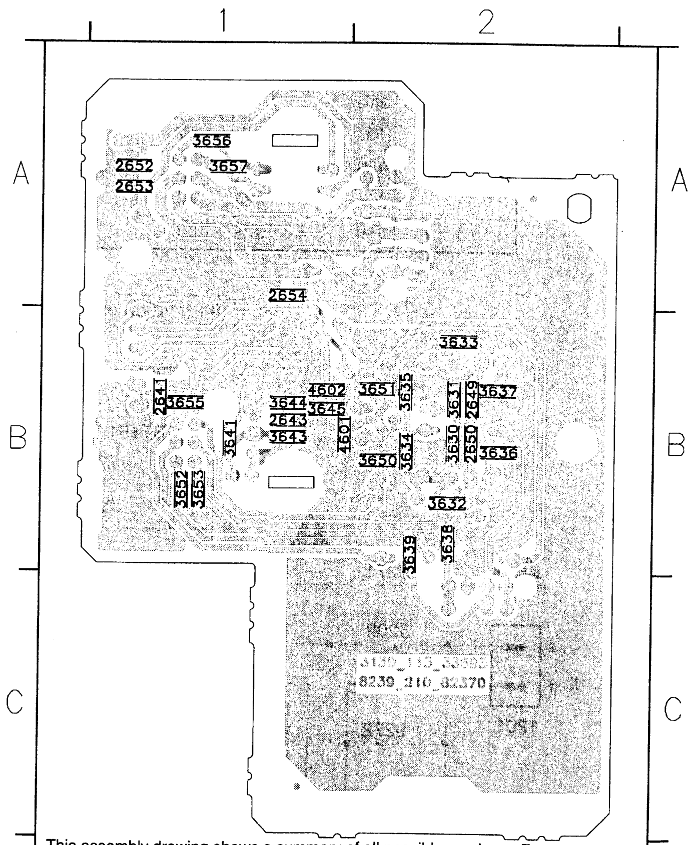
COMBI BOARD - KARAOKE & HEADPHONE PART
COMPONENT & CHIP LAYOUT

1324 A2	2642 B2	2648 B1	5321 A2	7641 B2	9604 A2
1504 C1	2644 B1	2651 B2	5322 A2	7642 B1	9605 B1
1505 A1	2645 B1	3647 B2	5324 A2	7643 B1	9606 B1
1642 B2	2647 B1	3648 B1	5640 B2	9603 A2	


HEAD PHONE
KARA OK
8239_210_82370
1
2
A
B
C

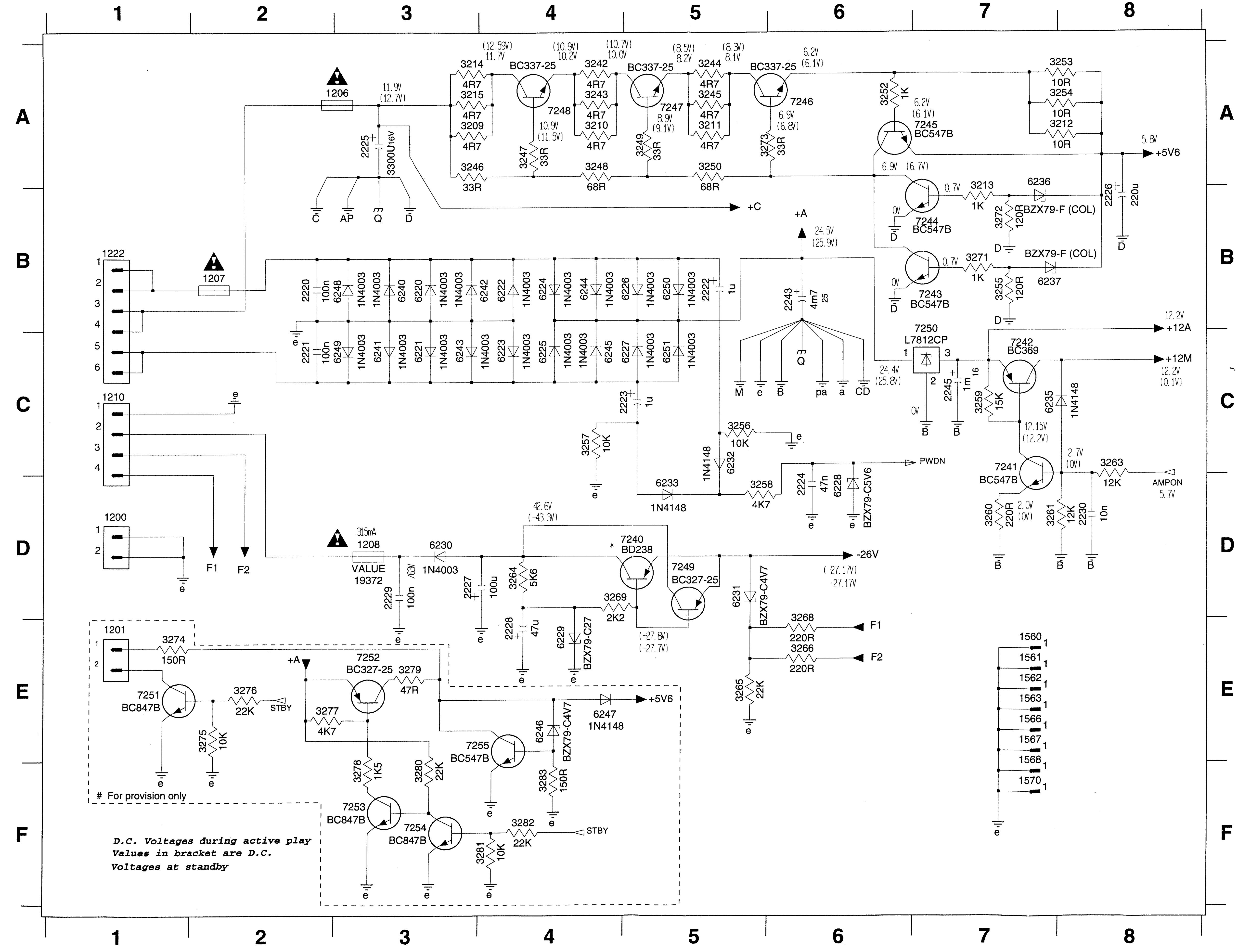
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

2641 B1	2653 A1	3633 B2	3638 B2	3645 B1	3655 B1
2643 B1	2654 A1	3634 B2	3639 B2	3650 B2	3656 A1
2649 B2	3630 B2	3635 B2	3641 B1	3651 B2	3657 A1
2650 B2	3631 B2	3636 B2	3643 B1	3652 B1	4601 B1
2652 A1	3632 B2	3637 B2	3644 B1	3653 B1	4602 B1


8239_210_82370
1
2
A
B
C

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

COMBI BOARD - POWER SUPPLY (MAIN PART) CIRCUIT DIAGRAM

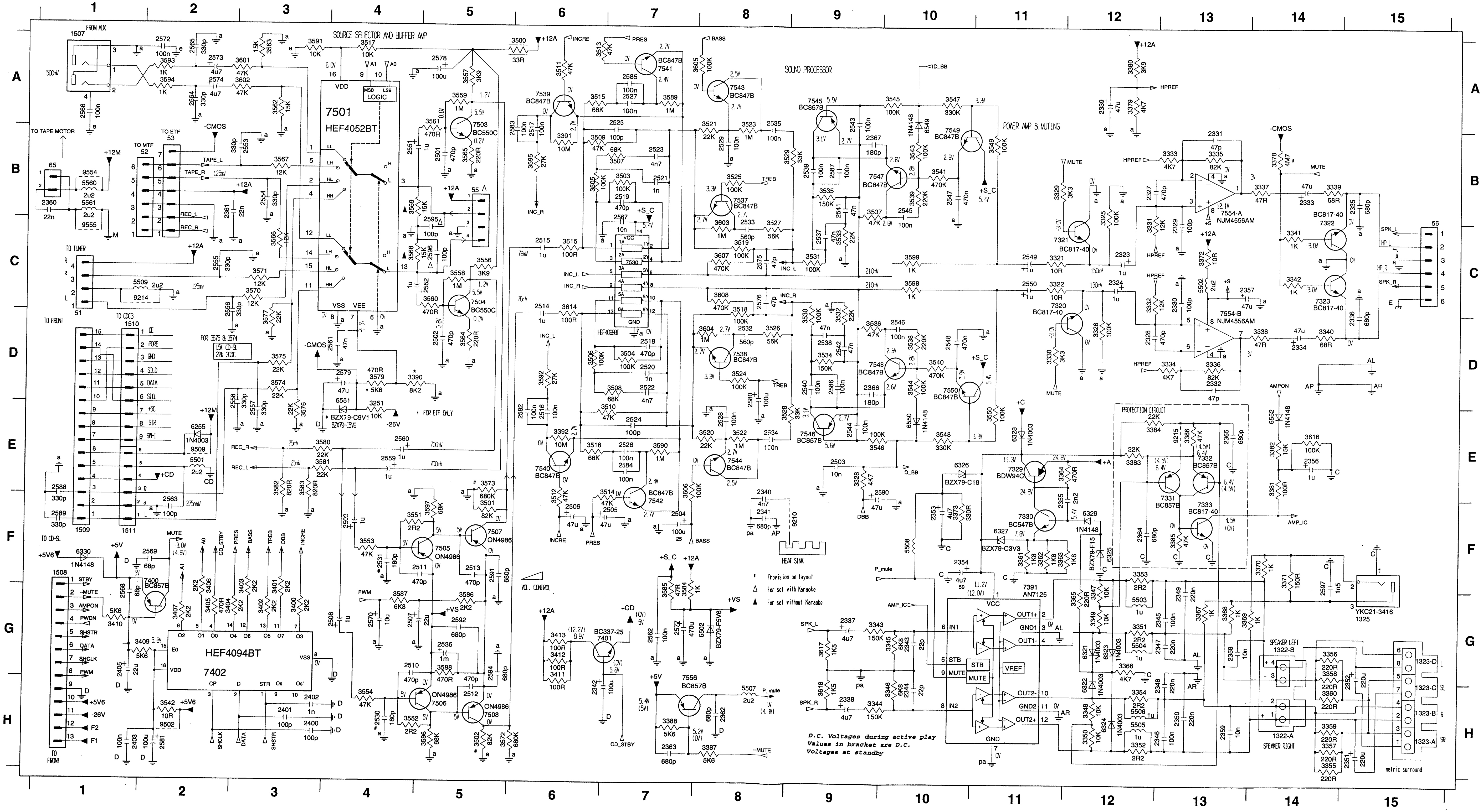

1
2
3
4
5
6
7
8
A
B
C
D
E
F
1206
11.9V
(12.7V)
2225
3300U16V
C
AP
Q
D
+C
3214
4R7
3215
4R7
3209
4R7
3246
33R
(12.59V)
11.7V
BC337-25
7248
10.9V
(11.5V)
3247
33R
(10.9V)
10.2V
3242
4R7
3243
4R7
3210
4R7
3248
68R
(10.7V)
10.0V
BC337-25
7247
8.9V
(9.1V)
3249
33R
(8.5V)
8.2V
3244
4R7
3245
4R7
3211
4R7
3250
68R
(8.3V)
8.1V
BC337-25
7246
6.9V
(6.8V)
3273
33R
6.2V
(6.1V)
3252
1K
6.2V
(6.1V)
7245
BC547B
3253
10R
3254
10R
3212
10R
5.8V
+5V6
6.9V
(6.7V)
0.7V
3213
1K
6236
BZX79-F (COL)
3272
120R
0V
7244
BC547B
2226
220u
7243
BC547B
0.7V
3271
1K
3255
120R
BZX79-F (COL)
6237
+A
24.5V
(25.9V)
2243
4m7
25
M
e
B
pa
a
CD
1222
1207
2220
100n
2221
100n
6248
6249
1N4003
6240
6241
6220
6221
6242
6243
6222
6223
6224
6225
6244
6245
6226
6227
6250
6251
2222
1u
2223
1u
3257
10K
3256
10K
1N4148
6232
6233
1N4148
3258
4K7
2224
47n
6228
BZX79-C5V6
PWDN
7250
L7812CP
24.4V
(25.8V)
0V
2245
1m
16
12.2V
+12A
7242
BC369
+12M
12.2V
(0.1V)
3259
15K
6235
1N4148
12.15V
(12.2V)
7241
BC547B
2.7V
(0V)
3263
12K
AMPON
5.7V
3260
220R
2.0V
(0V)
3261
12K
2230
10n
1210
1200
F1
F2
315mA
1208
VALUE
19372
6230
1N4003
2229
100n
/63V
2227
100u
42.6V
(-43.3V)
3264
5K6
*
7240
BD238
7249
BC327-25
-26V
(-27.17V)
-27.17V
3269
2K2
2228
47u
6229
BZX79-C27
(-27.8V)
(-27.7V)
6231
BZX79-C4V7
3268
220R
3266
220R
3265
22K
1201
3274
150R
7251
BC847B
3276
22K
STBY
3275
10K
# For provision only
7252
BC327-25
3279
47R
3277
4K7
6247
1N4148
+5V6
7255
BC547B
6246
BZX79-C4V7
3278
1K5
3280
22K
3283
150R
7253
BC847B
7254
BC847B
3282
22K
STBY
3281
10K
1560
1561
1562
1563
1566
1567
1568
1570

D.C. Voltages during active play
Values in bracket are D.C.
Voltages at standby

1200	D1
1201	E1
1206	A3
1207	B2
1208	D3
1210	C1
1222	B1
1560	E7
1561	E7
1562	E7
1563	E7
1566	E7
1567	E7
1568	F7
1570	F7
2220	B2
2221	C2
2222	B5
2223	C5
2224	D6
2225	A3
2226	B8
2227	D3
2228	E4
2229	D3
2230	D8
2243	B6
2245	C7
3209	A3
3210	A4
3211	A5
3212	A8
3213	B7
3214	A3
3215	A3
3242	A4
3243	A4
3244	A5
3245	A5
3246	A3
3247	A4
3248	A4
3249	A5
3250	A5
3252	A6
3253	A8
3254	A8
3255	B7
3256	C5
3257	C4
3258	D5
3259	C7
3260	D7
3261	D7
3263	C8
3264	D4
3265	E5
3266	E6
3268	E6
3269	D4
3271	B7
3272	B7
3273	A5
3274	E1
3275	E2
3276	E2
3277	E2
3278	F3
3279	E3
3280	F3
3281	F4
3282	F4
3283	F4
6220	B3
6221	C3
6222	B4
6223	C4
6224	B4
6225	C4
6226	B5
6227	C5
6228	D6
6229	E4
6230	D3
6231	D5
6232	C5
6233	D5
6235	C7
6236	A7
6237	B7
6240	B3
6241	C3
6242	B4
6243	C3
6244	B4
6245	C4
6246	E4
6247	E4
6248	B3
6249	C3
6250	B5
6251	C5
7240	D4
7241	C7
7242	C7
7243	B7
7244	B7
7245	A7
7246	A6
7247	A5
7248	A4
7249	D5
7250	C7
7251	E1
7252	E3
7253	F3
7254	F3
7255	E4

COMBI BOARD - SOURCE SELECT & AMPLIFIER (MAIN PART) CIRCUIT DIAGRAM

51	D1
52	B1
53	B2
55	B5
56	B15
65	B1
1322-A	H14
1322-B	G14
1323-A	H15
1323-B	H15
1323-C	G15
1323-D	G15
1325	G15
1507	A1
1508	F1
1509	F1
1510	D1
1511	F1
2323	C12
2324	C12
2327	B12
2328	D12
2329	C13
2330	C13
2331	B13
2332	D13
2333	B14
2334	D14
2335	B15
2336	D15
2337	G9
2338	H9
2339	A12
2340	E8
2341	F8
2342	H6
2343	G10
2344	H10
2345	G13
2346	H13
2347	G13
2348	H13
2349	G13
2350	H13
2351	H15
2352	G15
2353	F10
2354	F10
2355	F11
2356	E14
2357	C13
2358	G13
2359	H13
2360	B1
2361	B2
2362	H8
2363	H7
2364	F12
2365	E13
2366	D9
2367	B9
2400	H3
2401	H3
2402	H3
2403	H1
2405	G1
2501	B5
2502	D5
2503	E9
2504	F7
2505	F7
2506	F6
2507	G4
2508	G4
2509	F4
2510	G4
2511	F5
2512	H5
2513	F5
2514	C6
2515	C6
2516	E6
2517	B6
2518	D7
2519	B7
2520	D7
2521	B7
2522	D7
2523	B7
2524	E7
2525	A7
2526	E7
2527	A7
2528	E8
2529	B8
2530	H4
2531	F4
2532	D8
2533	C8
2534	E8
2535	A8
2536	G5
2537	C9
2538	D9
2539	B9
2540	D9
2541	B9
2542	D9
2543	A9
2544	E9
2545	B10
2546	D10
2547	B10
2548	D10
2549	C11
2550	C11
2551	B4
2552	C5
2553	B3
2554	B3
2555	C2
2556	D2
2557	E3
2558	E3
2559	E4
2560	E4
2561	D4
2562	G7
2563	F2
2564	A2
2565	A2
2566	A1
2567	B7
2568	G1
2569	F2
2570	G4
2572	A2
2573	A2
2574	A2
2575	C8
2576	C8
2577	G7
2578	A5
2579	D4
2580	D8
2581	H2
2582	E6
2583	B5
2584	E7
2585	A7
2586	D9
2587	B9
2588	E1
2589	F1
2590	E10
2591	F5
2592	G5
2594	G5
2595	C5
2596	C5
2597	F14
3251	E4
3321	C11
3322	C11
3325	B12
3326	D12
3328	E9
3329	B11
3330	D11
3331	C12
3332	C12
3333	B13
3334	D13
3335	B13
3336	D13
3337	B14
3338	D14
3339	B14
3340	D14
3341	C14
3342	C14
3343	G9
3344	H9
3345	G10
3346	H10
3347	G12
3348	H12
3349	G12
3350	H12
3351	G12
3352	H12
3353	F12
3354	H12
3355	H14
3356	G14
3357	H14
3358	G14
3359	H14
3360	H14
3361	F11
3362	F11
3363	F11
3364	E11
3365	G12
3366	G12
3367	G13
3368	G13
3369	G13
3370	F14
3371	F14
3372	C13
3373	F10
3378	B14
3379	A12
3380	A12
3381	E14
3382	E14
3383	E12
3384	E12
3385	F13
3386	E13
3387	H8
3388	H7
3390	D4
3391	B6
3392	E6
3400	G3
3401	G3
3402	G3
3403	G3
3404	G2
3405	G2
3406	G2
3407	G2
3409	G2
3410	G1
3411	G6
3412	G6
3413	G6
3500	A6
3501	F5
3502	H5
3503	B7
3504	D7
3505	B6
3506	D6
3507	B7
3508	D7
3509	B6
3510	E7
3511	A6
3512	E6
3513	A6
3514	E7
3515	A6
3516	E6
3517	A4
3518	C8
3519	C8
3520	E8
3521	A8
3522	E8
3523	A8
3524	D8
3525	B8
3526	D8
3527	C8
3528	E8
3529	B8
3530	D9
3531	C9
3532	D9
3533	C9
3534	D9
3535	B9
3536	D9
3537	B9
3538	D10
3539	B10
3540	D10
3541	B10
3542	H2
3543	B10
3544	D10
3545	A10
3546	E9
3547	A10
3548	E10
3549	B11
3550	E11
3551	F4
3552	H4
3553	F4
3554	H4
3556	C5
3557	A5
3558	C5
3559	A5
3560	C5
3561	A5
3562	A3
3563	A3
3564	D5
3565	B5
3566	C3
3567	B3
3568	C4
3569	B4
3570	C3
3571	C3
3572	H5
3573	E5
3574	D3
3575	D3
3576	E3
3577	D3
3579	D4
3580	E3
3581	E3
3582	E3
3583	E3
3584	G7
3585	G7
3586	G5
3587	G4
3588	G5
3589	A7
3590	E7
3591	A3
3592	D6
3593	A2
3594	A2
3595	B6
3596	H5
3597	F5
3598	C10
3599	C10
3601	A3
3602	A3
3603	C8
3604	D8
3605	A7
3606	E7
3607	C8
3608	C8
3614	C6
3615	C6
3616	E14
3617	G9
3618	H9
5501	E2
5502	C13
5503	G12
5504	G12
5505	H12
5506	H12
5507	H8
5508	F10
5509	C1
5560	B1
5561	B1
6255	E2
6321	G12
6322	H12
6323	G12
6324	H12
6325	F12
6326	E10
6327	F11
6328	E11
6329	F12
6330	F1
6502	G8
6549	A10
6550	E10
6551	E4
6552	E14
7320	C11
7321	C11
7322	B14
7323	C14
7329	E11
7330	F11
7331	E13
7332	E13
7333	F13
7391	F11
7400	F2
7401	G6
7402	G3
7501	A3
7503	A5
7504	C5
7505	F5
7506	H5
7507	F5
7508	H5
7530	C7
7537	B8
7538	D8
7539	A6
7540	E6
7541	A7
7542	F7
7543	A8
7544	E8
7545	A9
7546	E9
7547	B10
7548	D10
7549	A10
7550	D10
7554-A	B13
7554-B	C13
7556	G7
9210	F9
9214	C1
9215	E13
9502	H2
9509	E2
9554	B1
9555	C1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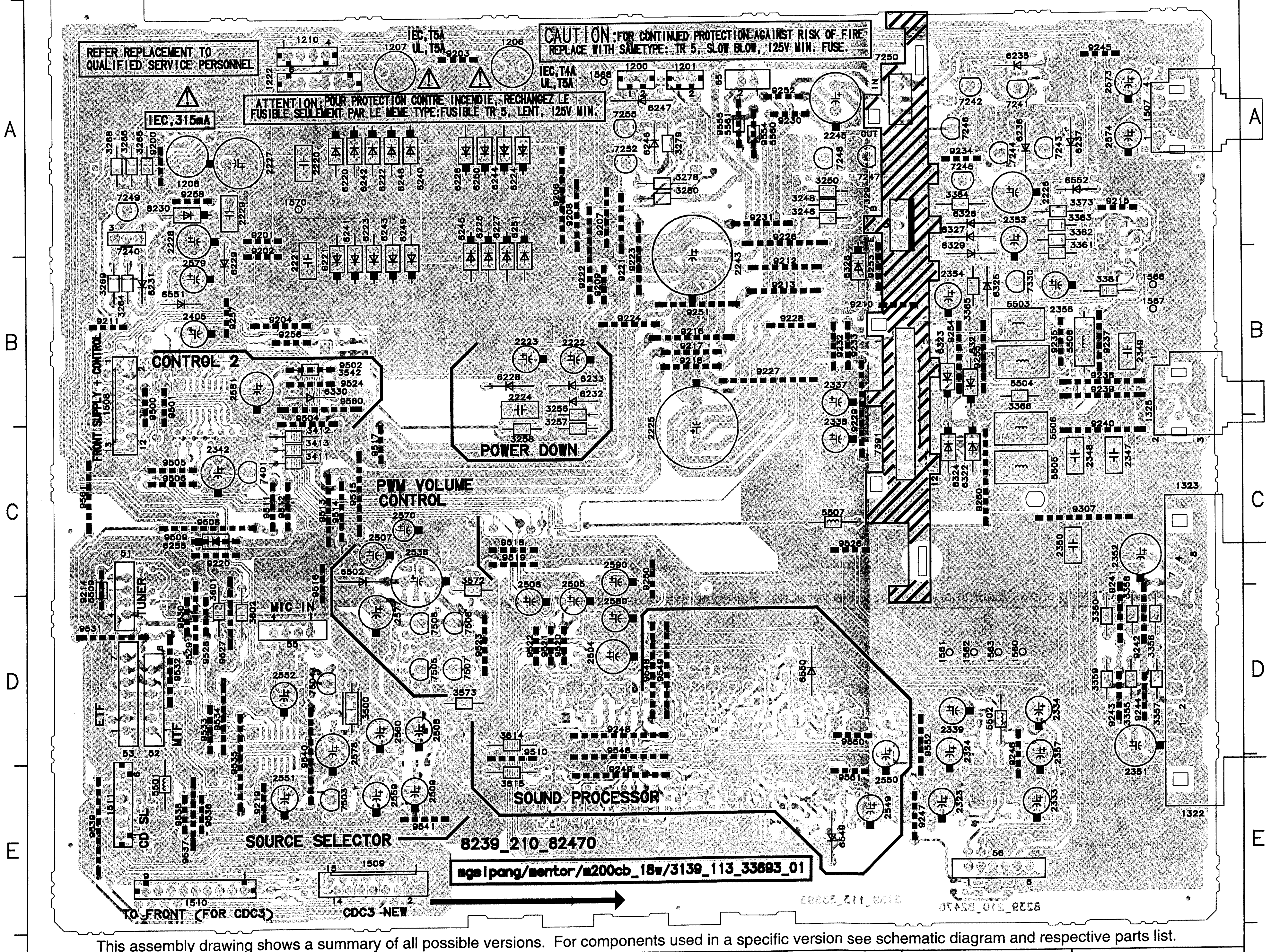
14
15
A
B
C
D
E
F
G
H
FROM AUX
1507
TO TAPE MOTOR
TO MTF
TO ETF
TO TUNER
TO FRONT
TO CDC3
TO CD-SL
SOURCE SELECTOR AND BUFFER AMP
7501
HEF4052BT
LOGIC
SOUND PROCESSOR
POWER AMP & MUTING
7530
HEF4066BT
7554-A
NJM4556AM
7554-B
NJM4556AM
PROTECTION CIRCUIT
7391
AN7125
7402
HEF4094BT
HEAT SINK
VOL. CONTROL
SPEAKER LEFT
SPEAKER RIGHT
YKC21-3416
matric surround
FOR 3575 & 3574
15k CD-SL
22k 3CDC
* FOR ETF ONLY
Provision on layout
For set with Karaoke
For set without Karaoke
D.C. Voltages during active play
Values in bracket are D.C.
Voltages at standby

51	C1
52	D1
53	D1
55	D2
56	E6
65	A4
1200	A4
1201	A4
1206	A3
1207	A3
1208	A1
1210	A2
1222	A2
1322	E7
1323	C7
1325	B7
1507	A7
1508	B1
1509	E2
1510	E1
1511	E1
1560	D6
1561	D6
1562	D6
1563	D6
1566	B7
1567	B7
1568	A4
1570	A2
2220	A2
2221	B2
2222	B4
2223	B3
2224	B3
2225	C4
2226	A6
2227	A2
2228	A1
2229	A2
2243	B5
2245	A5
2323	E6
2324	D6
2333	E6
2334	D6
2337	B5
2338	C5
2339	D6
2342	C1
2347	C7
2348	C7
2349	B7
2350	C6
2351	E7
2352	C7
2353	A6
2354	B6
2356	B6
2357	D6
2405	B1
2504	D4
2505	C4
2506	C3
2507	C2
2508	D3
2509	E3
2536	C3
2549	E5
2550	E5
2551	E2
2552	D2
2559	E3
2560	D3
2570	C3
2573	A7
2574	A7
2577	D3
2578	D2
2579	B1
2580	D4
2581	B2
2590	C4
3246	A5
3248	A5
3250	A5
3256	B3
3257	B3
3258	C3
3264	B1
3265	A1
3266	A1
3268	A1
3269	B1
3278	A4
3279	A4
3280	A4
3355	D7
3356	D7
3357	D7
3358	D7
3359	D7
3360	D7
3361	A7
3362	A7
3363	A7
3364	A6
3365	B6
3366	B6
3373	A7
3381	B7
3411	C2
3412	C2
3413	C2
3500	D2
3542	B2
3572	C3
3573	D3
3601	C1
3602	D2
3614	D3
3615	E3
5501	E1
5502	D6
5503	B6
5504	B6
5505	C6
5506	C6
5507	C5
5508	B6
5509	C1
5560	A5
5561	A4
6220	A2
6221	B2
6222	A2
6223	A2
6224	A3
6225	A3
6226	A3
6227	A3
6228	B3
6229	B2
6230	A1
6231	B1
6232	B4
6233	B4
6235	A6
6236	A6
6237	A7
6240	A3
6241	A2
6242	A2
6243	A2
6244	A3
6245	A3
6246	A4
6247	A4
6248	A3
6249	A3
6250	A3
6251	A3
6255	C1
6321	B6
6322	C6
6323	B6
6324	C6
6325	B6
6326	A6
6327	A6
6328	B5
6329	A6
6330	B2
6502	C2
6549	E5
6550	D5
6551	B1
6552	A7
7240	A1
7241	A6
7242	A6
7243	A6
7244	A6
7245	A6
7246	A6
7247	A5
7248	A5
7249	A1
7250	A5
7252	A4
7255	A4
7329	A5
7330	B6
7391	C5
7401	C2
7503	E2
7504	D2
7505	D3
7506	D3
7507	D3
7508	D3
9200	A1
9201	A2
9202	A2
9203	A3
9204	B2
9206	A3
9207	A4
9208	A4
9209	B4
9210	B5
9211	B1
9212	B5
9213	B5
9214	C1
9215	A7
9216	B4
9217	B4
9218	B4
9219	E2
9220	C1
9221	B4
9222	B4
9223	B4
9224	B4
9226	A5
9227	B5
9228	B5
9229	C5
9230	A5
9231	A5
9232	B5
9233	B5
9234	A6
9235	B6
9237	B7
9238	B7
9239	B7
9240	C7
9241	C7
9242	D7
9243	D7
9244	D7
9245	A7
9246	D6
9247	E6
9248	D4
9249	E4
9250	C4
9251	B4
9252	A5
9253	B5
9254	B6
9255	B6
9256	B2
9257	B2
9258	A1
9260	C6
9307	C7
9500	B1
9501	B1
9502	B2
9504	B2
9505	C1
9506	C1
9508	C1
9509	C1
9510	D3
9511	C2
9512	C2
9513	C2
9514	C2
9515	C2
9516	C2
9517	C2
9518	C3
9519	C3
9520	D3
9521	D3
9522	D3
9523	D3
9524	B2
9526	C5
9527	D2
9528	D1
9529	D1
9530	D1
9531	D1
9532	D1
9533	D1
9534	D1
9535	D2
9536	E1
9537	E1
9538	E1
9539	E1
9540	D2
9541	E3
9546	D4
9548	D4
9549	D4
9550	D5
9551	E5
9552	D6
9554	A5
9555	A4
9560	B2
9561	C1

COMBI BOARD - MAIN PART COMPONENT LAYOUT


REFER REPLACEMENT TO QUALIFIED SERVICE PERSONNEL
CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE REPLACE WITH SAMETYPE: TR 5, SLOW BLOW, 125V MIN. FUSE.
ATTENTION: POUR PROTECTION CONTRE INCENDIE, RECHANGEZ LE FUSIBLE SEULEMENT PAR LE MEME TYPE: FUSIBLE TR 5, LENT, 125V MIN.
IEC,T5A UL,T5A
IEC,T4A UL,T5A
IEC,315mA
FRONT SUPPLY + CONTROL
CONTROL 2
POWER DOWN
PWM VOLUME CONTROL
TUNER
MIC IN
ETF
MTF
CD SL
SOURCE SELECTOR
SOUND PROCESSOR
8239_210_82470
mgslpang/mentor/m200cb_18w/3139_113_33693_01
TO FRONT (FOR CDC3)
CDC3 NEW
A
B
C
D
E

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

2230	A2
2327	E2
2328	D2
2329	E2
2330	D2
2331	E2
2332	D2
2335	E2
2336	E2
2340	B3
2341	B3
2343	B3
2344	C3
2345	B2
2346	C2
2355	B2
2358	C1
2359	D1
2360	A3
2361	D7
2362	B6
2363	B6
2364	A1
2365	A1
2366	D3
2367	E3
2400	C6
2401	C6
2402	C6
2403	B6
2501	E6
2502	D6
2503	D3
2510	D5
2511	D5
2512	D5
2513	D5
2514	D5
2515	E5
2516	D5
2517	E5
2518	D4
2519	E4
2520	D4
2521	E4
2522	D4
2523	E4
2524	D4
2525	E4
2526	D4
2527	E4
2528	D4
2529	E4
2530	D6
2531	D5
2532	D4
2533	E4
2534	D3
2535	E3
2537	E3
2538	D3
2539	E3
2540	D3
2541	E3
2542	D3
2543	E3
2544	D3
2545	E3
2546	D3
2547	E3
2548	D3
2553	D7
2554	D7
2555	C7
2556	C7
2557	E7
2558	E7
2561	E6
2562	C5
2563	E7
2564	A1
2565	A1
2566	A1
2567	D4
2568	B7
2569	B7
2572	A1
2575	E4
2576	D4
2582	D5
2583	E5
2584	D4
2585	E4
2586	D3
2587	E3
2588	E5
2589	E5
2591	D5
2592	D5
2594	D5
2595	D6
2596	D6
2597	B1
3209	A3
3210	A3
3211	A2
3212	A2
3213	A2
3214	A3
3215	A3
3242	A3
3243	A3
3244	A2
3245	A2
3247	A3
3249	A3
3251	B7
3252	A2
3253	A2
3254	A2
3255	A2
3259	A2
3260	A2
3261	A2
3263	A2
3271	A2
3272	A2
3273	A2
3274	A4
3275	A4
3276	A4
3277	A4
3281	
3282	
3283	
3321	
3322	
3325	
3326	
3328	
3329	
3330	
3331	
3332	
3333	
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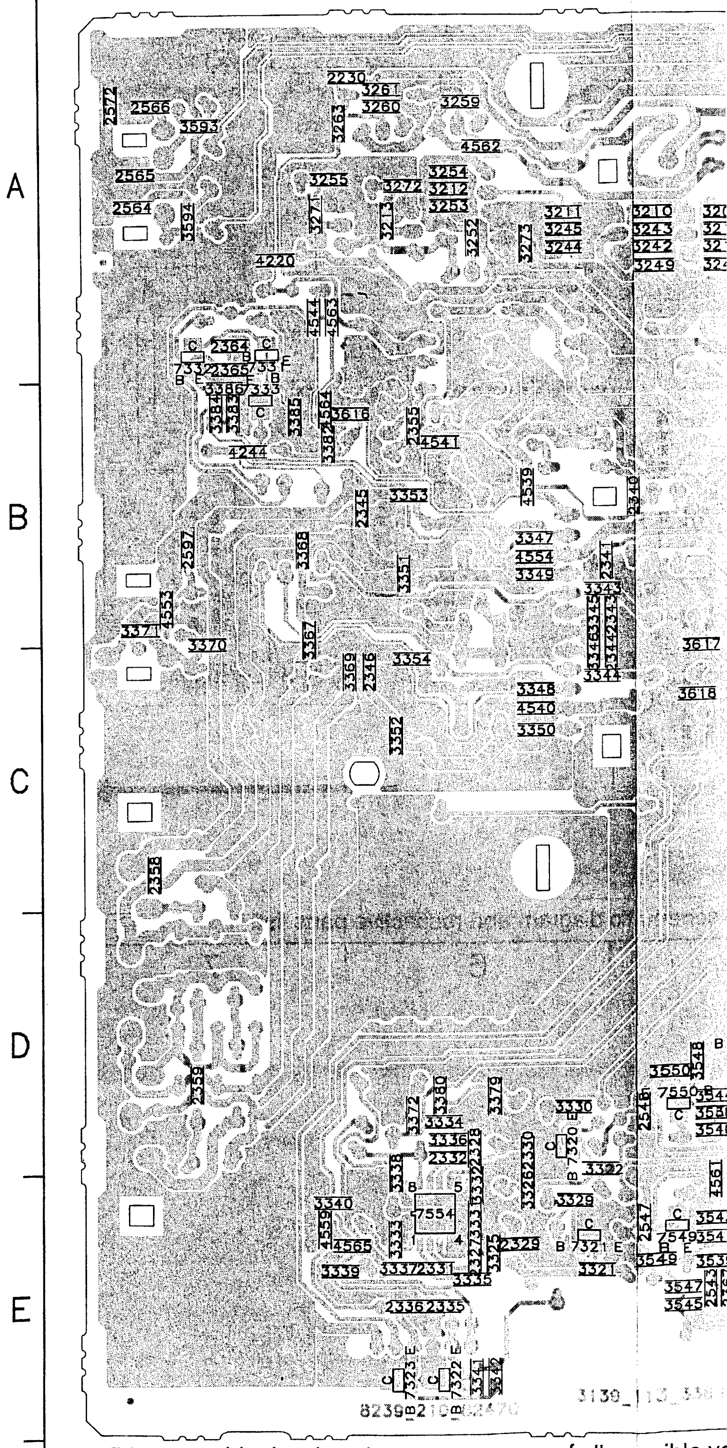
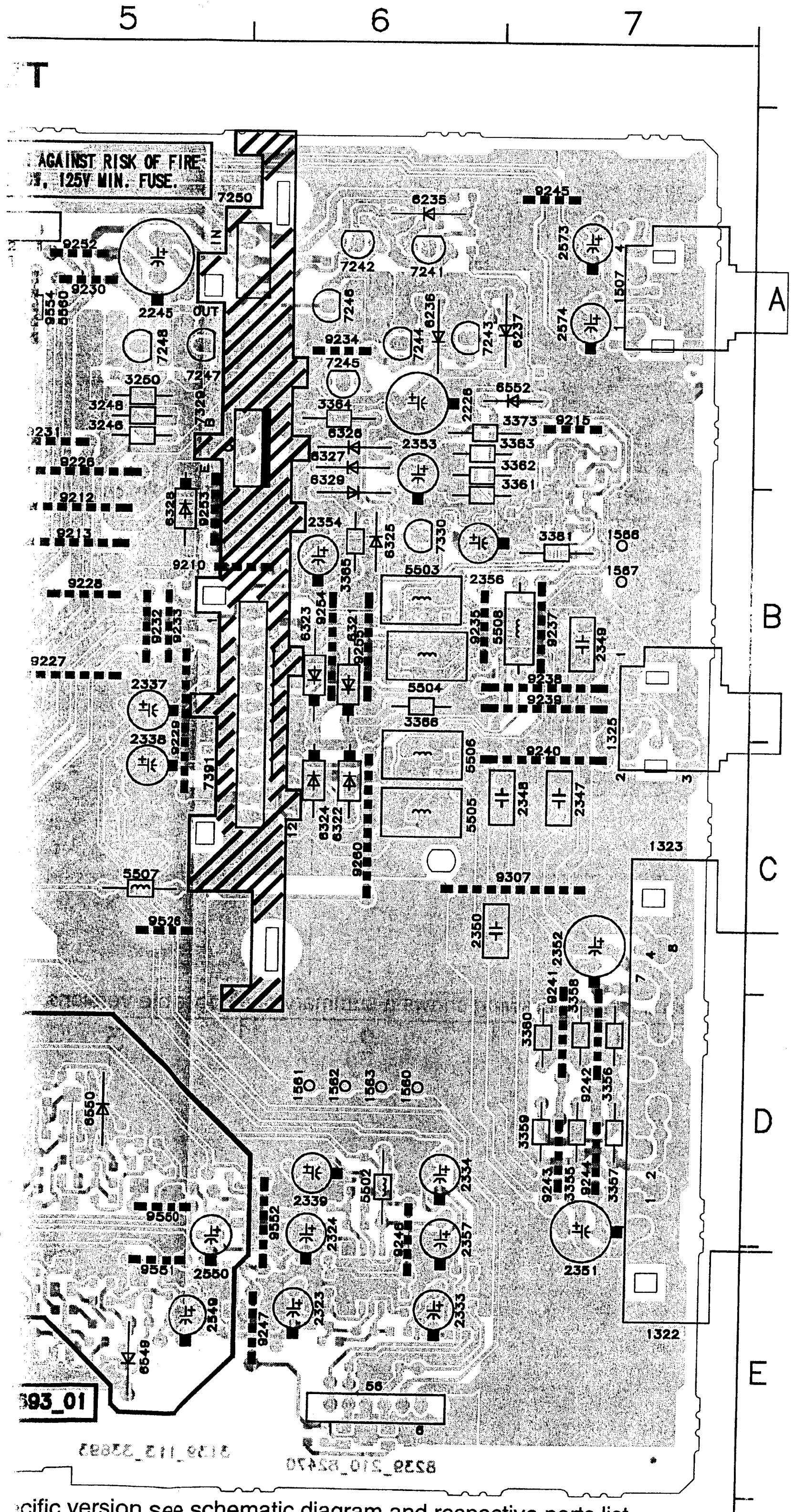
3342	

COMBI BOARD - MAIN PART CHIP LA


A
B
C
D
E
8239_210_82470

This assembly drawing shows a summary of all possible ve

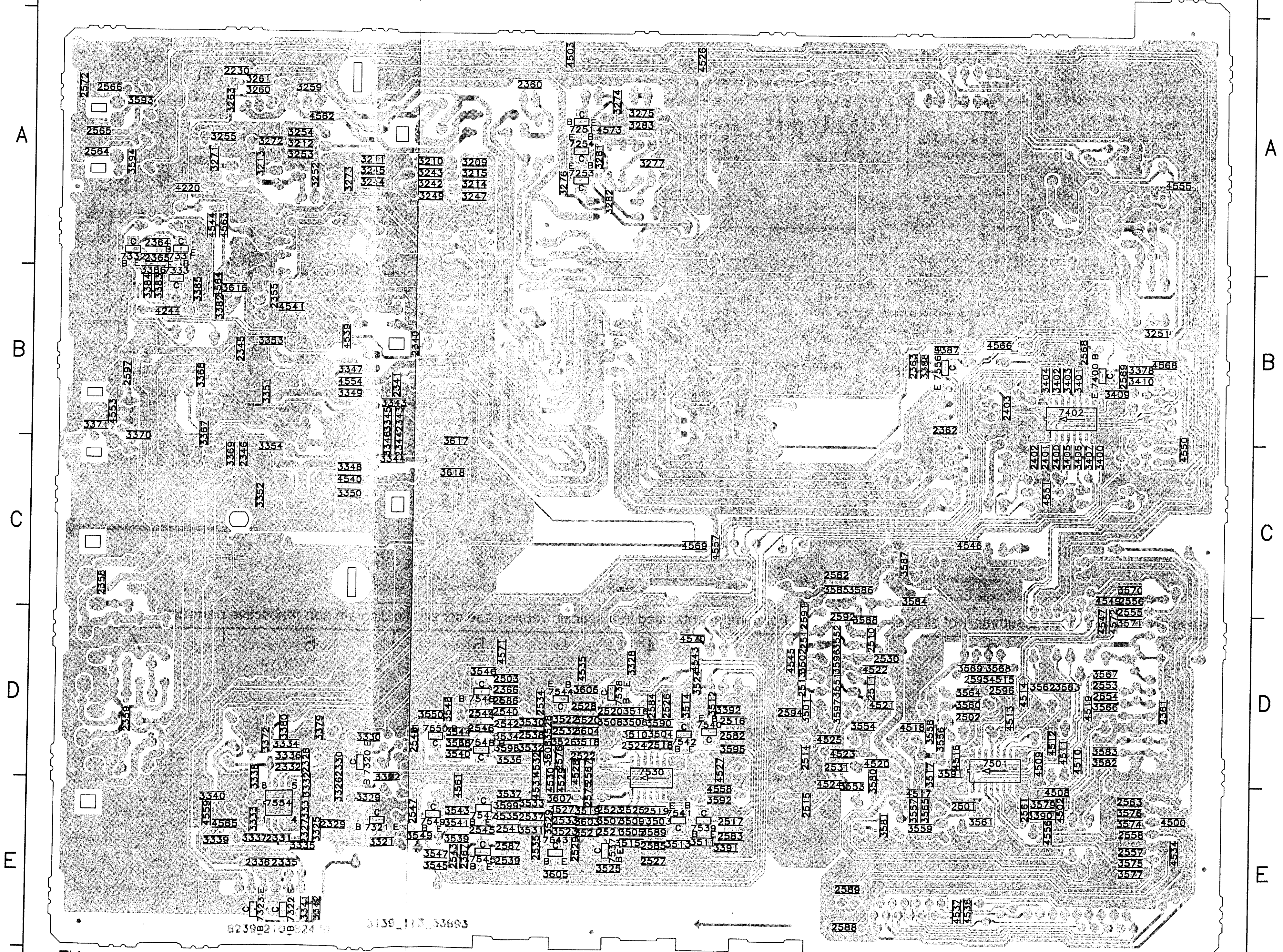
A6	7507	D3	9217	B4	9237	B7	9255	B6	9514	C2	9533	D1	9561	C1		
A6	7508	D3	9218	B4	9238	B7	9256	B2	9515	C2	9534	D1				
A6	9200	A1	9219	E2	9239	B7	9257	B2	9516	C2	9535	D2				
A6	9201	A2	9220	C1	9240	C7	9258	A1	9517	C2	9536	E1				
A5	9202	A2	9221	B4	9241	C7	9260	C6	9518	C3	9537	E1				
A5	9203	A3	9222	B4	9242	D7	9307	C7	9519	C3	9538	E1				
A1	9204	B2	9223	B4	9243	D7	9500	B1	9520	D3	9539	E1				
A5	9206	A3	9224	B4	9244	D7	9501	B1	9521	D3	9540	D2				
A4	9207	A4	9226	A5	9245	A7	9502	B2	9522	D3	9541	E3				
A4	9208	A4	9227	B5	9246	D6	9504	B2	9523	D3	9546	D4				
A5	9209	B4	9228	B5	9247	E6	9505	C1	9524	B2	9548	D4				
B6	9210	B5	9229	C5	9248	D4	9506	C1	9526	C5	9549	D4				
C5	9211	B1	9230	A5	9249	E4	9508	C1	9527	D2	9550	D5				
C2	9212	B5	9231	A5	9250	C4	9509	C1	9528	D1	9551	E5				
E2	9213	B5	9232	B5	9251	B4	9510	D3	9529	D1	9552	D6				
D2	9214	C1	9233	B5	9252	A5	9511	C2	9530	D1	9554	A5				
D3	9215	A7	9234	A6	9253	B5	9512	C2	9531	D1	9555	A4				
D3	9216	B4	9235	B6	9254	B6	9513	C2	9532	D1	9560	B2				



cific version see schematic diagram and respective parts list.

2230	A2	2364	A1	2521	E4	2544	D3	2576	D4	3242	A3	3281	A4	3343	B3	3383	B1	3504	D4	3526	D4	3549	E3	3574	E7	3597	D5	4513	D6	4536	E6	4563	A2	7501	D6
2327	E2	2365	A1	2522	D4	2545	E3	2582	D5	3243	A3	3282	A4	3344	C3	3384	B1	3505	E4	3527	E4	3550	D3	3575	E7	3598	D3	4514	D6	4537	E6	4564	B2	7530	D4
2328	D2	2366	D3	2523	E4	2546	D3	2583	E5	3244	A2	3283	A4	3345	B3	3385	B1	3506	D4	3528	D4	3551	D5	3576	E7	3599	E3	4515	D6	4539	B2	4565	E2	7537	E4
2329	E2	2367	E3	2524	D4	2547	E3	2584	D4	3245	A2	3321	E3	3346	C3	3386	B1	3507	E4	3529	E4	3552	D5	3577	E7	3603	E4	4516	D6	4540	C2	4566	B6	7538	D4
2330	D2	2400	C6	2525	E4	2548	D3	2585	E4	3247	A3	3322	D3	3347	B2	3387	B6	3508	D4	3530	D3	3553	E5	3579	E6	3604	D4	4517	E6	4541	B2	4568	B7	7539	E4
2331	E2	2401	C6	2526	D4	2553	D7	2586	D3	3249	A3	3325	E2	3348	C2	3388	B6	3509	E4	3531	E3	3554	D5	3580	D5	3605	E4	4518	D6	4543	D4	4569	C4	7540	D4
2332	D2	2402	C6	2527	E4	2554	D7	2587	E3	3251	B7	3326	E2	3349	B2	3390	E6	3510	D4	3532	D3	3556	D6	3581	E6	3606	D4	4519	D7	4544	A2	4570	D4	7541	E4
2335	E2	2403	B6	2528	D4	2555	C7	2588	E5	3252	A2	3328	D4	3350	C2	3391	E5	3511	E4	3533	E3	3557	E6	3582	D7	3607	E4	4520	D5	4545	D5	4571	D3	7542	D4
2336	E2	2501	E6	2529	E4	2556	C7	2589	E5	3253	A2	3329	E2	3351	B2	3392	D5	3512	D4	3534	D3	3558	D6	3583	D7	3608	D4	4521	D5	4546	C6	4572	D7	7543	E4
2340	B3	2502	D6	2530	D6	2557	E7	2591	D5	3254	A2	3330	D2	3352	C2	3400	C7	3513	E4	3535	E3	3559	E6	3584	C6	3616	B2	4522	D5	4547	D7	4573	A4	7544	D4
2341	B3	2503	D3	2531	D5	2558	E7	2592	D5	3255	A2	3331	E2	3353	B2	3401	B7	3514	D4	3536	D3	3560	D6	3585	C5	3617	C3	4523	D5	4549	C7	7251	A4	7545	E3
2343	B3	2510	D5	2532	D4	2561	E6	2594	D5	3259	A2	3332	E2	3354	C2	3402	B6	3515	E4	3537	E3	3561	E6	3586	C5	3618	C3	4524	D5	4550	C7	7253	A4	7546	D3
2344	C3	2511	D5	2533	E4	2562	C5	2595	D6	3260	A2	3333	E2	3367	B2	3403	B7	3516	D4	3538	D3	3562	D6	3587	C6	4220	A1	4525	D5	4551	C6	7254	A4	7547	E3
2345	B2	2512	D5	2534	D3	2563	E7	2596	D6	3261	A2	3334	D2	3368	B1	3404	B6	3517	D6	3539	E3	3563	D7	3588	D5	4244	B1	4526	A4	4553	B1	7320	D2	7548	D3
2346	C2	2513	D5	2535	E3	2564	A1	2597	B1	3263	A2	3335	E2	3369	C2	3405	C7	3518	D4	3540	D3	3564	D6	3589	E4	4500	E7	4527	D5	4554	B2	7321	E3	7549	E3
2355	B2	2514	D5	2537	E3	2565	A1	3209	A3	3271	A2	3336	D2	3370	B1	3406	C7	3519	E4	3541	E3	3565	E6	3590	D4	4502	E7	4528	D4	4555	A7	7322	E2	7550	D3
2358	C1	2515	E5	2538	D3	2566	A1	3210	A3	3272	A2	3337	E2	3371	B1	3407	C7	3520	D4	3543	E3	3566	D7	3591	D6	4503	A4	4529	D4	4556	E6	7323	E2	7554	E2
2359	D1	2516	D5	2539	E3	2567	D4	3211	A2	3273	A2	3338	D2	3372	D2	3409	B7	3521	E4	3544	D3	3567	D7	3592	E5	4508	E7	4530	D4	4557	C5	7331	A1	7556	B6
2360	A3	2517	E5	2540	D3	2568	B7	3212	A2	3274	A4	3339	E2	3378	B7	3410	B7	3522	D4	3545	E3	3568	D6	3593	A1	4509	D6	4531	E3	4558	E5	7332	A1		
2361	D7	2518	D4	2541	E3	2569	B7	3213	A2	3275	A4	3340	E2	3379	D2	3501	D5	3523	E4	3546	D3	3569	D6	3594	A1	4510	D7	4532	D3	4559	E2	7333	B1		
2362	B6	2519	E4	2542	D3	2572	A1	3214	A3	3276	A4	3341	E2	3380	D2	3502	D5	3524	D4	3547	E3	3570	C7	3595	D5	4511	D7	4534	E7	4561	E3	7400	B7		
2363	B6	2520	D4	2543	E3	2575	E4	3215	A3	3277	A4	3342	E2	3382	B2	3503	E4	3525	E4	3548	D3	3571	D7	3596	D5	4512	D6	4535	D4	4562	A2	7402	B7		

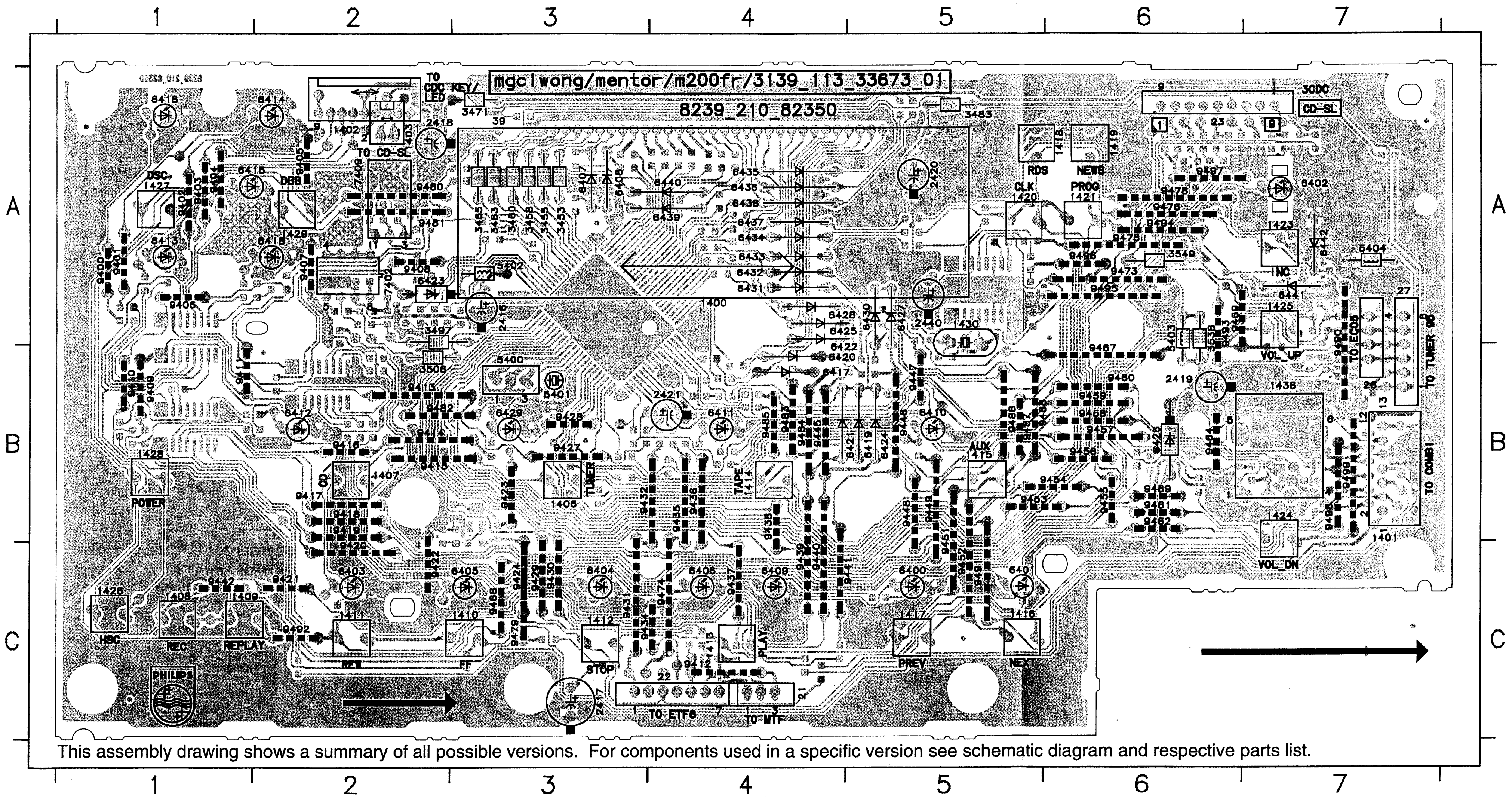
COMBI BOARD - MAIN PART CHIP LAYOUT



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

FRONT BOARD - COMPONENT LAYOUT

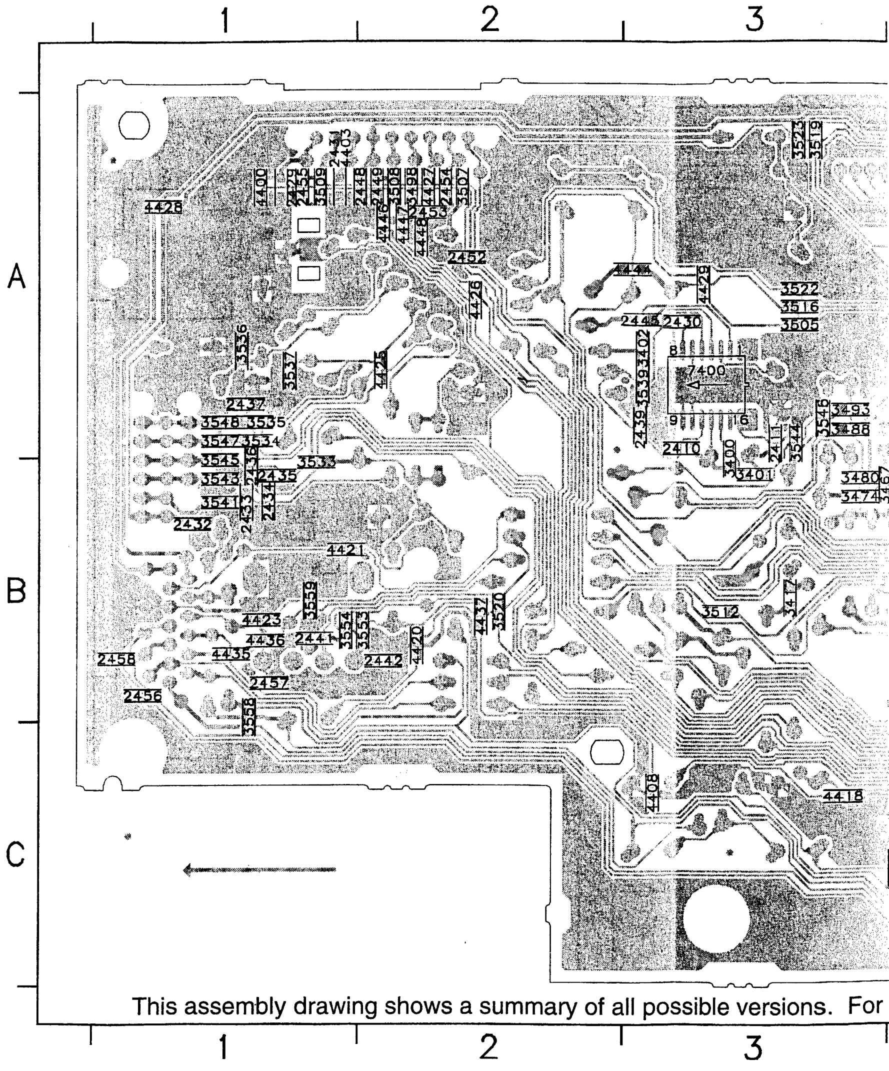
21	C4	1407	B2	1417	C5	1428	B1	2440	A5	3506	B2	6402	A7	6412	B2	6422	B4	6432	A4	6442	A7	9407	A2	9417	B2	9429	C3	9440	C4	9453	B5	9464	B6	9480	A2	9490	A7
22	C4	1408	C1	1418	A6	1429	A2	3453	A3	3538	A6	6403	C2	6413	A1	6423	A2	6433	A4	7402	A2	9408	A2	9418	B2	9430	C3	9441	C5	9454	B6	9467	B6	9481	A2	9491	C5
23	A6	1409	C1	1419	A6	1430	A5	3455	A3	3549	A6	6404	C3	6414	A2	6424	B5	6434	A4	7409	A2	9409	B1	9419	B2	9431	C3	9442	C1	9455	B6	9468	C3	9482	B2	9492	C2
26	B7	1410	C3	1420	A5	1436	B7	3458	A3	5400	B3	6405	C3	6415	A1	6425	A4	6435	A4	9400	A1	9410	B1	9420	C2	9432	B3	9445	B4	9456	B6	9469	A6	9483	B4	9493	A6
27	A7	1411	C2	1421	A6	2416	A3	3460	A3	5401	B3	6406	C4	6416	A1	6426	B6	6436	A4	9401	A1	9411	B1	9421	C2	9434	C3	9446	B5	9457	B6	9473	A6	9484	B4	9494	A6
1400	A4	1412	C3	1423	A7	2417	C3	3463	A3	5402	A3	6407	A3	6417	B4	6427	A5	6437	A4	9402	A1	9412	C4	9422	C2	9435	B4	9447	B5	9458	B6	9474	C4	9485	B4	9495	A6
1401	B7	1413	C4	1424	B7	2418	A2	3465	A3	5403	A6	6408	A3	6418	A2	6428	A4	6438	A4	9403	A1	9413	B2	9423	B3	9436	B4	9448	B5	9459	B6	9475	A6	9486	B5	9496	A6
1402	A2	1414	B4	1425	A7	2419	B6	3471	A3	5404	A7	6409	C4	6419	B5	6429	B3	6439	A4	9404	A1	9414	B2	9424	C3	9437	C4	9449	B5	9460	B6	9476	A6	9487	B5	9497	A6
1403	A2	1415	B5	1426	C1	2420	A5	3483	A5	6400	C5	6410	B5	6420	B4	6430	A5	6440	A4	9405	A2	9415	B2	9427	B3	9438	B4	9451	B5	9461	B6	9478	A6	9488	B5	9498	B7
1406	B3	1416	C5	1427	A1	2421	B4	3497	A2	6401	C5	6411	B4	6421	B5	6431	A4	6441	A7	9406	A1	9416	B2	9428	B3	9439	C4	9452	C5	9462	B6	9479	C3	9489	B6	9499	B7



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

FRONT BOARD - CHIP LAYOUT

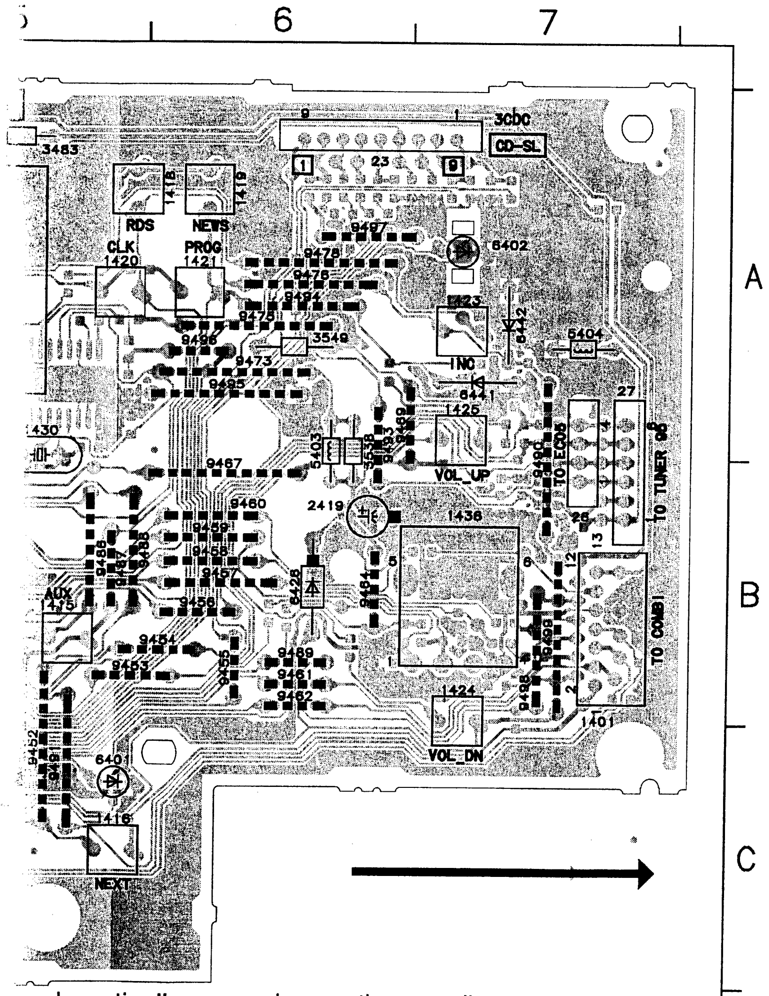
2408	B5	2427	A6	2441	B1	2456	B1	3410	A6	3423	A4	3436	A5	3448	A7
2409	B5	2428	B5	2442	B2	2457	B1	3411	B6	3424	A4	3437	A4	3449	A7
2410	A3	2429	A1	2443	B5	2458	B1	3412	A6	3425	A4	3438	A4	3451	A7
2411	A3	2430	A3	2444	A6	3400	B3	3413	B6	3426	A4	3439	A4	3452	A7
2412	B7	2431	A1	2445	A3	3401	B3	3414	A6	3427	A4	3440	A4	3454	B4
2414	A6	2432	B1	2446	B7	3402	A3	3415	A6	3428	A4	3441	A4	3456	B4
2415	B4	2433	B1	2448	A2	3403	B6	3416	B6	3429	A4	3442	A4	3457	A7
2422	C5	2434	B1	2449	A2	3405	A6	3417	B3	3430	A4	3443	A4	3459	B4
2423	B5	2435	B1	2452	A2	3406	A6	3419	B4	3431	B4	3444	A4	3462	B4
2424	B5	2436	B1	2453	A2	3407	B7	3420	A5	3433	B7	3445	A4	3464	B4
2425	B5	2437	A1	2454	A2	3408	B6	3421	A4	3434	A5	3446	B4	3467	B3
2426	A6	2439	A3	2455	A1	3409	B6	3422	A4	3435	A5	3447	B4	3469	A5



This assembly drawing shows a summary of all possible versions. For

FRONT BOARD - CHIP LAYOUT

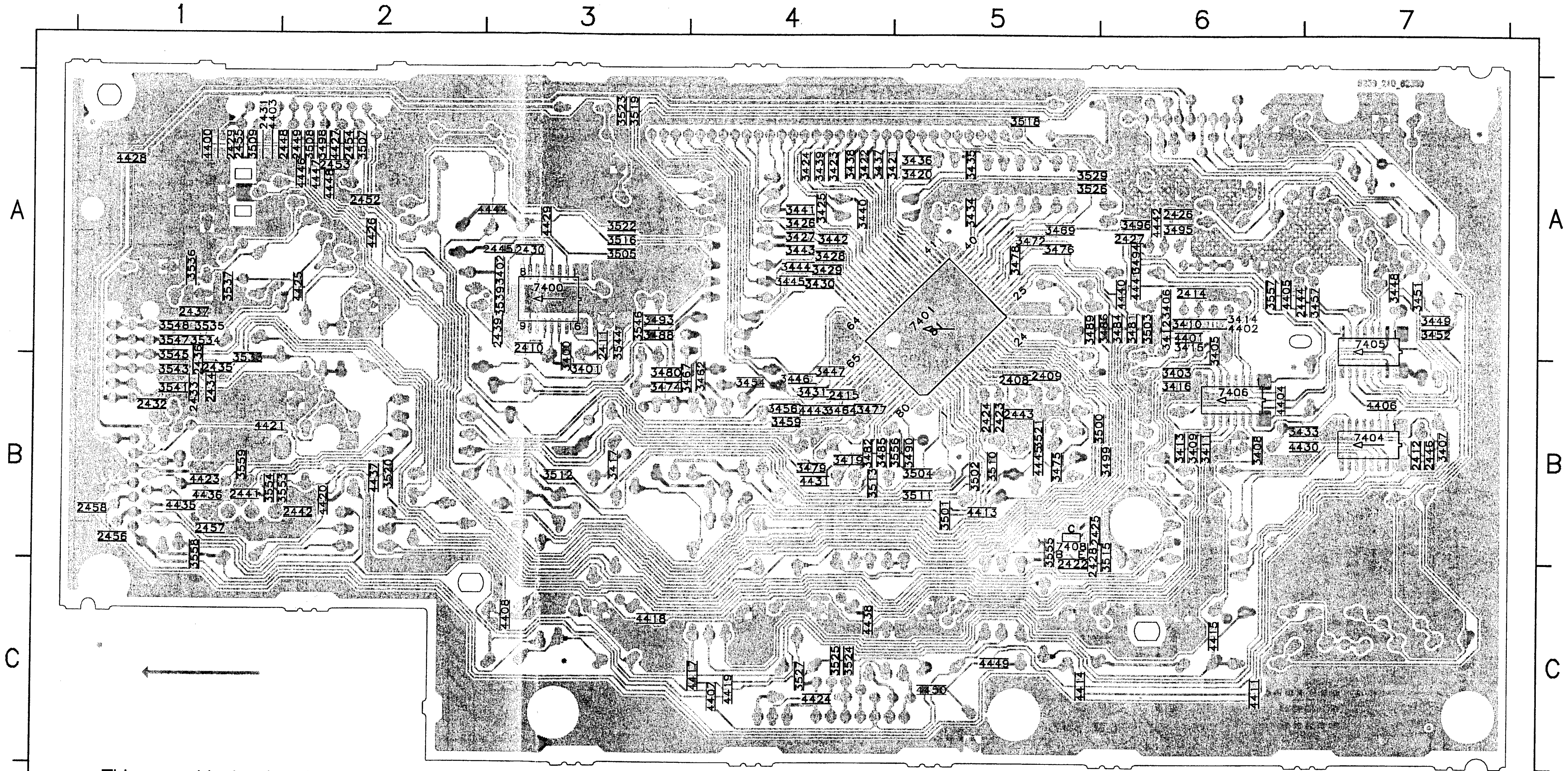
9417	B2	9429	C3	9440	C4	9453	B5	9464	B6	9480	A2	9490	A7
9418	B2	9430	C3	9441	C5	9454	B6	9467	B6	9481	A2	9491	C5
9419	B2	9431	C3	9442	C1	9455	B6	9468	C3	9482	B2	9492	C2
9420	C2	9432	B3	9445	B4	9456	B6	9469	A6	9483	B4	9493	A6
9421	C2	9434	C3	9446	B5	9457	B6	9473	A6	9484	B4	9494	A6
9422	C2	9435	B4	9447	B5	9458	B6	9474	C4	9485	B4	9495	A6
9423	B3	9436	B4	9448	B5	9459	B6	9475	A6	9486	B5	9496	A6
9424	C3	9437	C4	9449	B5	9460	B6	9476	A6	9487	B5	9497	A6
9427	B3	9438	B4	9451	B5	9461	B6	9478	A6	9488	B5	9498	B7
9428	B3	9439	C4	9452	C5	9462	B6	9479	C3	9489	B6	9499	B7



schematic diagram and respective parts list.

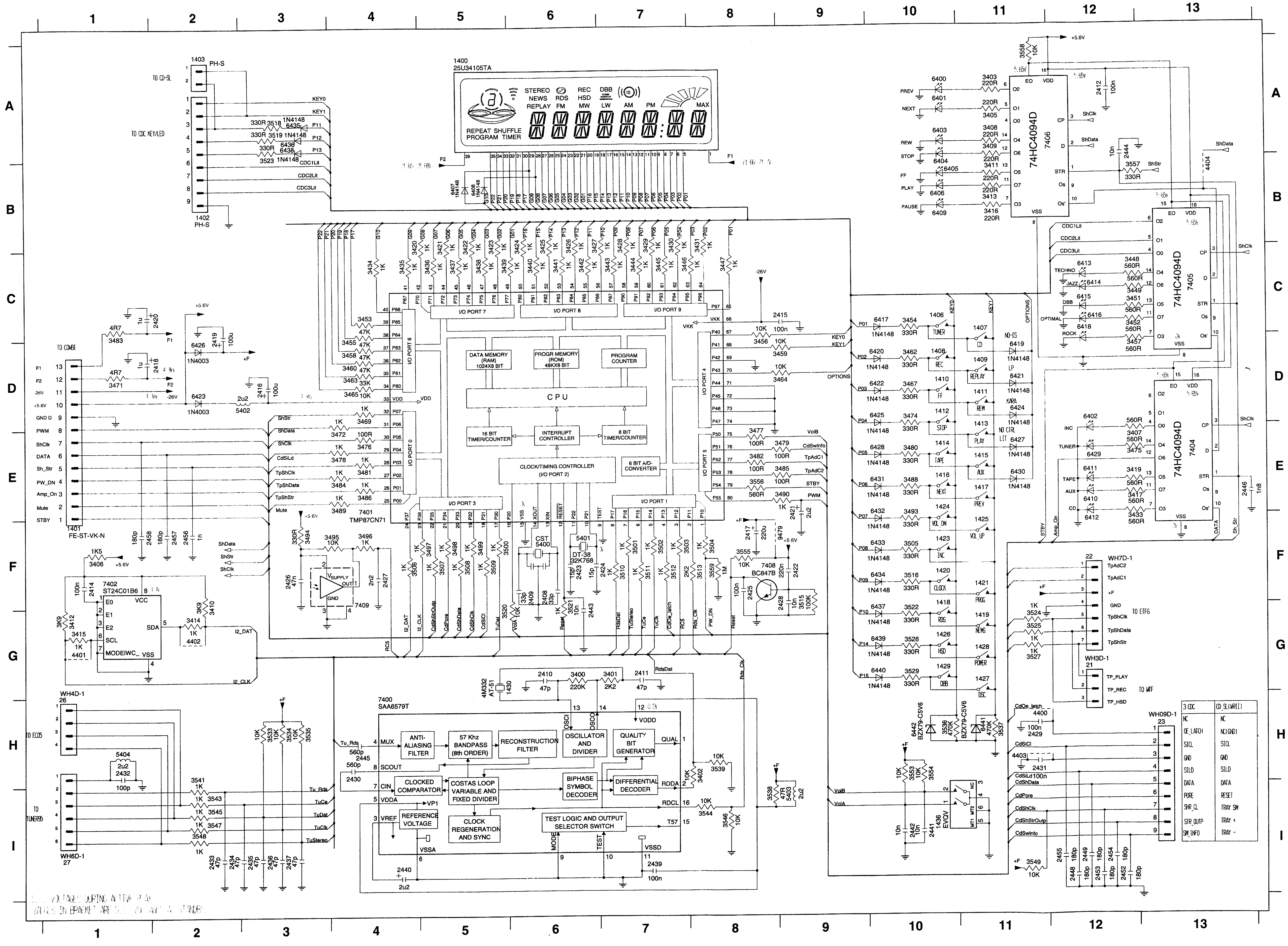
2408	B5	2427	A6	2441	B1	2456	B1	3410	A6	3423	A4	3436	A5	3448	A7	3472	A5
2409	B5	2428	B5	2442	B2	2457	B1	3411	B6	3424	A4	3437	A4	3449	A7	3474	B3
2410	A3	2429	A1	2443	B5	2458	B1	3412	A6	3425	A4	3438	A4	3451	A7	3475	B5
2411	A3	2430	A3	2444	A6	3400	B3	3413	B6	3426	A4	3439	A4	3452	A7	3476	A5
2412	B7	2431	A1	2445	A3	3401	B3	3414	A6	3427	A4	3440	A4	3454	B4	3477	B4
2414	A6	2432	B1	2446	B7	3402	A3	3415	A6	3428	A4	3441	A4	3456	B4	3478	A5
2415	B4	2433	B1	2448	A2	3403	B6	3416	B6	3429	A4	3442	A4	3457	A7	3479	B4
2422	C5	2434	B1	2449	A2	3405	A6	3417	B3	3430	A4	3443	A4	3459	B4	3480	B3
2423	B5	2435	B1	2452	A2	3406	A6	3419	B4	3431	B4	3444	A4	3462	B4	3481	A6
2424	B5	2436	B1	2453	A2	3407	B7	3420	A5	3433	B7	3445	A4	3464	B4	3482	B4
2425	B5	2437	A1	2454	A2	3408	B6	3421	A4	3434	A5	3446	B4	3467	B3	3484	A6
2426	A6	2439	A3	2455	A1	3409	B6	3422	A4	3435	A5	3447	B4	3469	A5	3485	B4

3486	A6	3502	B5	3516	A3	3533	B1	3548	A1	4404	B6	4420	B2	4436	B1	4449	C5
3488	A3	3503	A6	3518	A5	3534	A1	3553	B2	4405	A6	4421	B1	4437	B2	4450	C5
3489	A5	3504	B5	3519	A3	3535	A1	3554	B1	4406	B7	4423	B1	4438	C4	7400	A3
3490	B5	3505	A3	3520	B2	3536	A1	3555	B5	4407	C4	4424	C4	4440	A6	7401	A5
3493	A3	3507	A2	3521	B5	3537	A1	3556	B5	4408	C3	4425	A2	4441	A6	7404	B7
3494	A6	3508	A2	3522	A3	3539	A3	3557	A6	4411	C6	4426	A2	4442	A6	7405	A7
3495	A6	3509	A1	3523	A3	3541	B1	3558	B1	4413	B5	4427	A2	4443	B4	7406	B6
3496	A6	3510	B5	3524	C4	3543	B1	3559	B1	4414	C5	4428	A1	4444	A3	7408	B5
3498	A2	3511	B5	3525	C4	3544	A3	4400	A1	4415	C6	4429	A3	4445	B5		
3499	B6	3512	B3	3526	A5	3545	B1	4401	A6	4417	C4	4430	B7	4446	A2		
3500	B5	3513	B4	3527	C4	3546	A3	4402	A6	4418	C3	4431	B4	4447	A2		
3501	B5	3515	B6	3529	A5	3547	A1	4403	A1	4419	C4	4435	B1	4448	A2		



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

CIRCUIT DIAGRAM - FRONT BOARD


1400
25U34105TA
STEREO
NEWS
REPLAY
RDS
FM
REC
HSD
MW
DBB
LW
AM
PM
MAX
REPEAT SHUFFLE
PROGRAM TIMER
1403
PH-S
TO CD-SL
TO CDC KEY/LED
1402
PH-S
KEY0
KEY1
CDC1Lit
CDC2Lit
CDC3Lit
TO COMBI
1401
FE-ST-VK-N
F1
F2
-26V
+5.6V
GND D
PWM
ShClk
DATA
Sh_Str
PW_DN
Amp_On
Mute
STBY
7401
TMP87CN71
I/O PORT 7
I/O PORT 8
I/O PORT 9
I/O PORT 6
I/O PORT 0
I/O PORT 4
I/O PORT 5
I/O PORT 3
I/O PORT 1
DATA MEMORY (RAM) 1024X8 BIT
PROGR MEMORY (ROM) 48KX8 BIT
PROGRAM COUNTER
CPU
16 BIT TIMER/COUNTER
INTERRUPT CONTROLLER
8 BIT TIMER/COUNTER
CLOCK/TIMING CONTROLLER (I/O PORT 2)
6 BIT A/D-CONVERTER
CST 5400
DT-38 32K768
7402
ST24C01B6
MODEIWC_
VCC
SDA
SCL
VSS
7409
VSUPPLY
OUT
GND
7408
BC847B
7400
SAA6579T
MUX
ANTI-ALIASING FILTER
57 Khz BANDPASS (8th ORDER)
RECONSTRUCTION FILTER
OSCILLATOR AND DIVIDER
QUALITY BIT GENERATOR
QUAL
SCOUT
CIN
CLOCKED COMPARATOR
COSTAS LOOP VARIABLE AND FIXED DIVIDER
BIPHASE SYMBOL DECODER
DIFFERENTIAL DECODER
RDDA
VDDA
VP1
VREF
REFERENCE VOLTAGE
CLOCK REGENERATION AND SYNC
TEST LOGIC AND OUTPUT SELECTOR SWITCH
RDCL
T57
VSSA
VSSD
VDDD
MODE
TEST
OSCI
OSCO
4M332
AT-51
WH4D-1
TO ECO5
WH6D-1
TO TUNER95
Tu_Rds
TuCe
TuDat
TuClk
TuStereo
7406
74HC4094D
7405
74HC4094D
7404
74HC4094D
EO
VDD
CP
STR
Os
Os'
VSS
PREV
NEXT
REW
STOP
FF
PLAY
PAUSE
ShData
ShClk
ShStr
TECHNO
JAZZ
DBB
OPTIMAL
ROCK
INC
TUNER
TAPE
AUX
CD
TUNER
CD
REC
REPLAY
FF
STOP
PLAY
TAPE
AUX
NEXT
PREV
VOL DN
VOL UP
INC
CLOCK
PROG
RDS
NEWS
HSD
POWER
DBB
DSC
KEY0
KEY1
OPTIONS
VolB
VolA
1436
EVQV
BZX79-C5V6
WH7D-1
TO ETF6
TpAdC2
TpAdC1
+F
GND
TpShClk
TpShData
TpShStr
WH3D-1
TO MTF
TP_PLAY
TP_REC
TP_HSD
WH09D-1
3 CDC
CD_SL(VARI-E)
NC
OE_LATCH
NC(GND)
SICL
GND
SILD
DATA
PORE
RESET
SHR_CL
TRAY SW
STR_OUTP
TRAY +
SPI_INFO
TRAY -
CdOe_latch
CdSiCl
CdSiLd
CdShData
CdPore
CdShClk
CdShStrOutp
CdSwInfo
1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
VOLTAGES DURING ACTIVE PLAY
VALUES IN BRACKET ARE [illegible]

21	G12
22	F12
23	H13
26	H1
27	I1
1400	A5
1401	F1
1402	B2
1403	A2
1406	C10
1407	C11
1408	D10
1409	D11
1410	D10
1411	D11
1412	D10
1413	E11
1414	E10
1415	E11
1416	E10
1417	E11
1418	G10
1419	G11
1420	F10
1421	F11
1423	F10
1424	E10
1425	F11
1426	G10
1427	G11
1428	G11
1429	G10
1430	G5
1436	I10
2408	F6
2409	F6
2410	G6
2411	G7
2412	A12
2414	F1
2415	C9
2416	D3
2417	F8
2418	D2
2419	C2
2420	C2
2421	E9
2422	F9
2423	F6
2424	F6
2425	F8
2426	F3
2427	F4
2428	F8
2429	H11
2430	H4
2431	H11
2432	H1
2433	I2
2434	I2
2435	I3
2436	I3
2437	I3
2439	I7
2440	I4
2441	I10
2442	I10
2443	G6
2444	A12
2445	H4
2446	E13
2448	I12
2449	I12
2452	I12
2453	I12
2454	I12
2455	I12
2456	F2
2457	F2
2458	F1
3400	G6
3401	G7
3402	H8
3403	A11
3405	A11
3406	F1
3407	E12
3408	A11
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3535	H3
3536	H10
3537	H11
3538	I8
3539	H8
3541	H2
3543	I2
3544	I8
3545	I2
3546	I8
3547	I2
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7409	F4
9479	F8

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